Electronic Fish Catch Logbook

System Design

ACKNOWLEDGMENTS

This document was prepared by the Northwest Fisheries Science Center (NWFSC) based on the "Electronic Fish Catch Logbook - System Design" dated 20 April, 1999. The Electronic Fish Catch Logbook team consists of Carol A. Murray (NWFSC), and Stewart Toshach, David Fisher, and Terry Jensen (ARIS Corporation, Bellevue, WA). This work was completed as part of an ongoing project to develop an Electronic Fish Catch Logbook and is being funded under a grant from the Information Technology and Innovation Fund Committee of the National Performance Review. More information on the Fund can be found at:

www.gits.gov/htm/itfund.htm

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GLOSSARY OF TERMS

ACCSP	Atlantic Coast Cooperative Statistics Project
AML	Arc (ARC/INFO) Macro Language
API	Application Program Interface
ARC/INFO	A proprietary Geographical Information System
ASCII	American Standard Code for Information Interchange
Bandwidth	The transmission capacity, in bits per second, for a communications device
CDC	Central Database Connection
CPUE	Catch Per Unit Effort
CR	Character Return
CRADA	Cooperative Research and Development Agreement
DB	Database
EDI	Electronic Data Interchange
EFCL	Electronic Fish Catch Logbook
ESRI	Environmental Systems Research Institute – A GIS vendor
GIS	Geographical Information System
GMT	Greenwich Mean Time
GPS	Global Positioning System
HRTQ	Hours to Reach Quota
HTTP	HyperText Transfer Protocol
ISP	Internet Service Provider
IMS	Internet Map Service
LF	Line Feed
MAPI	Messaging Application Program Interface
MIME	Multi-purpose Internet Mail Extensions
MX	Mail Exchange Record for Domain Name Services entries
NPR	National Performance Review
NULL	An empty record
NWFSC	Northwest Fisheries Science Center
OCX	Object Linking and Embedding Custom Control. Common reference to a Microsoft Active X control or component
ONC	Open Networking Consortium
PacFIN	Pacific Fisheries Information Network
PC	Personal Computer
PCMCIA	Personal Computer Memory Card International Association
PIN	Personal Identification Number
PKI	Public Key Infrastructure
S/MIME	Secure Multi-purpose Internet Mail Extensions
SDE	Spatial Database Engine
SMTP	Simple Mail Transfer Protocol
TAPI	Telephony Application Program Interface
User Interface	The screens that you see when you are operating a computer
VHF	Very High Frequency Radio
VMS	Vessel Monitoring System
WOC	Washington, Oregon and California

1.0 INTRODUCTION

The Northwest Fisheries Science Center (NWFSC) has completed the system design specifications for the prototype electronic fish catch logbook (EFCL) it is developing. The system design defines the functions and processes the system will support and defines the components required to make the system operational. The primary audience for this document is developers and partners interested in providing parts of the EFCL system and users who are interested in the technical aspects of the EFCL.

1.1 Background

Fishers in the field report greater groundfish abundance than indicated by declining quotas set by the Pacific Fishery Management Council (PFMC). The PFMC works in partnership with National Oceanic and Atmospheric Administration (NOAA) Fisheries' Northwest Regional Office to provide sustainable management of West Coast fishery resources. These quotas are based on resource surveys and stock assessments conducted by the Northwest Fisheries Science Center, Southwest Fisheries Science Center, and Alaska Fisheries Science Center. These surveys and assessments are used by the PFMC to help determine sustainable harvest levels.

Fishers question the frequency, geographic range, and accuracy of these critical triennial surveys given their experience in the field. A recent National Research Council report said that the methods used to assess the abundance of fish stocks were the best available but could benefit from increased data on species abundance and reproduction potential.

Fishers believe that their logbooks contain information that could help scientists supplement resource surveys. Scientists, on the other hand, have traditionally favored fishery independent surveys because they could control the data collection to defined standards.

Fishers and NOAA Fisheries scientists have begun a number of short-term cooperative projects and pilot programs to explore ways to supplement surveys using chartered fishing vessels to collect biological and depth-specific groundfish data and to improve the groundfish logbook system.

1.2 Fishers' Request For An EFCL

The trawl industry, in a constituent meeting in late 1996, asked the NWFSC to develop and field test a prototype EFCL system to collect and analyze fish catch and logbook data.

Although the concept of an EFCL has been discussed within National Marine Fisheries Service (NMFS) for many years, funding to develop the technology has not been available to the agency. The West Coast trawl industry, frustrated by the reluctance of fishery managers to use logbook

data and by delays in processing fish catch data, looked for opportunities to improve reliance on logbook data for fishery management. Given the rapid advances in the use of computers on fishing vessels for locating and plotting vessel positions and advances in ship-to-shore communications, the industry reasoned that this technology could improve the use and reliance of logbook data for fishery management.

Following the request by the industry, the NWFSC applied to the Information Technology and Innovation Fund Committee of the National Performance Review (NPR) for funding for the EFCL project. The project was funded in September 1997. The Information Technology and Innovation Fund is intended to provide seed money for innovative projects that: 1) involve multiple agencies; 2) provide for more efficient or effective delivery of service to the public; and 3) are self-sustaining by a two-year timeframe with future reimbursement to the Fund, where feasible.

1.3 Project Goals

The goals of the EFCL project are to: 1) improve the confidence scientists have in fisher-collected logbook data; 2) increase the amount and uses of the data collected; 3) coordinate the data in a database management system for more efficient management and utilization of the fishery resource; and 4) develop and field test an electronic system for collection and analysis of fish catch and enhanced logbook data. The process that is being used to complete this project is modeled around the system development methodology defined by Richard Barker[1].

Specific goals of the EFCL include:

- Increase the value of the data collected.
  - Make the data more readily available to fishers to improve their ability to manage their fishing business.
  - Provide processors with information that will help them manage their operations.
  - Provide researchers with information of higher quality and quantity in a more timely manner.
- Improve confidence in the quality of the data so that it is used more frequently for fishery management purposes.
  - Reduce the labor and cost involved in collecting, reporting, and analyzing the data.
  - Provide a more efficient means of reconciling data provided by processors and fishers.
  - Provide more timely access to information by a wider range of users.
  - Ultimately provide better information to contribute to sustainable management of fishery resources.

By standardizing and validating the collection of logbook data, an EFCL is expected to:

- Allow electronic reporting of logbook data.
- Allow electronic reconciliation with fish-ticket information.

[1] Richard Barker, 1990. Computer Aided Software Engineering Methodology Tasks and Deliverables, Oracle Press, Addison-Wesley.

- Allow electronic reporting of observer data.

It is also expected that the development and use of this database will:

- Provide fishery managers with information to better monitor in-season harvest quotas and determine future quotas.
- Provide access to information (like quotas, etc.) to enable fishers to make better fishing business decisions.
- Provide processors with advance notice of vessel catch to make scheduling more efficient.

In addition, the NPR grant establishes two other goals:

- The system should be developed, where possible, by integrating commercial systems to demonstrate a successful partnership between public and private entities.
- The system should represent value to its users. This value should be sufficient to support a business plan that will allow the system to become self-sufficient.

The project was developed in stages. Stage I reviewed the current data collection processes and identified areas where the EFCL project could be of benefit. The operative premise was that success at meeting the objectives of those who will use the EFCL would result in a better quality of data, especially if suppliers of data also become users of that data.

Based on research and interviews with fishers, processors, and researchers, a report was prepared to identify the electronic data collection needs associated with the different communities involved in commercial trawl fishing operations along the Pacific coast in Washington, Oregon, and California (WOC). In May of 1998 the report from Stage I was released and circulated for comment.

In April of 1998, Stage II of the project began. Based on the findings identified in Stage I, the objective of Stage II was to complete the analysis of available technical alternatives and develop a design.

Stage II was broken into three parts. Stage IIa completed the analysis from the perspective of data user's needs in the WOC commercial groundfish fishery and produced a draft design review. The draft design review was completed in July of 1998 and circulated for review.

Stage IIb was a design review, project technical outreach and follow-on analysis effort. Considerable effort was extended to reach out to existing users within the WOC community, and to other fisheries.

During Stage IIc of the project, the project team collected information related to any and all requests for provision of electronic information. Based on the needs identified, the NWFSC recognized a number of ways to augment the project to support other efforts. Therefore the NWFSC applied to the NPR for supplemental funding. On 4 February 1999, the NWFSC was advised that additional funding had been provided for an observer information module.

Stage III of the project will develop a field-ready prototype. The system constructed will be a field-tested prototype system. Based on feedback received from its use, appropriate plans could

be made to scale the system for potential implementation across the fishing fleets in a follow-on effort. The prototype will be used to validate the EFCL system's ability to achieve the desired outcomes.

Stage III began with the Cooperative Research and Development Agreement (CRADA) process and the search for private and public partners. In November of 1998, the NWFSC created an opportunity for public or private partners to join the NWFSC in a CRADA. Advertisements were placed in the Commerce Business Daily and posted on the Internet. The period for responses closed in December, 1998, and evaluation of the responses followed. Based on the evaluation, the NWFSC decided to enter into negotiations to provide specific components or modules for the EFCL. These negotiations are ongoing (as of late 1999). Stage III is expected to end in the fall or winter of 1999.

1.4 Comments On Draft System Design

A draft of the system design for the prototype EFCL was released in July, 1998. It was posted via a public website at http://www.nwfsc.noaa.gov/logbook and efforts were made to provide wide distribution of the draft and to actively solicit comments. The draft document was presented to the following major groups: the Pacific Fisheries Information Network (PacFIN) Logbook Technical Workgroup, PFMC, NMFS Headquarters Group and Architecture Working Group, and the NMFS Southeast, Northeast, and Northwest Fisheries Science Centers.

As part of the review process, a number of data systems were identified that could be associated with the EFCL. As part of the analysis efforts, design work was completed to try to ensure that the EFCL project could augment and support other data system projects. Data systems reviewed include:

- Atlantic Coast Cooperative Statistic Program (ACCSP) database design.
- PacFIN Coast-Wide Biological Database Specification.
- Design notes from WOC Data Group Meeting.
- Marine Recreational Fisheries Statistical Survey Intercept Questionnaire.
- West Coast Fisheries Economic Data Plan.
- National Marine Fisheries Service Office of Law Enforcement Proposed Vessel Monitoring System.
- Southwest Fisheries Science Center CALCOM system.

Based on the findings of these efforts, a number of areas were identified where the original scope of the EFCL project could be augmented to complement other needs or efforts. In October of 1998, the EFCL project team made a submission to the Information Technology and Innovation Fund Committee of the National Performance Review to request funding to support collecting fish tickets in all United States fisheries, information about recreational fishing activities, comprehensive economic survey data, extensive sensor data (beyond the planned proof of concept for conductivity, depth and temperature), and observer data. The request also included funding for integrating business utilities (e.g., small business finance software) and efforts to implement

integration with possible Vessel Monitoring Systems (VMS).

The Committee elected to provide funding for the observer data portion of the funding request. A substantial effort then focused on ensuring that observer data would be included. The observer data collection needs for NMFS regions and British Columbia fishery efforts were reviewed as a part of this process.

Based on this review and comment process the draft system design was revised and the following changes incorporated into the April, 1999, final system design. (This technical memorandum reproduces the April, 1999, report with minor updates.)

- Minimal adjustments were made to the list of system functions to clarify and correct business operations that will be supported.
- A more detailed system architecture has been defined. The design is intended to provide a consistent modular architecture that can be tuned for regional implementation needs.
- The database design has been changed (see Appendix A for a detailed definition of changes). Most changes to the database design were made to ensure that the system would support statistical reporting and other analysis needs.
- A set of Electronic Data Interchange (EDI) transactions have been defined to standardize the way that information is exchanged between the shipboard application and the central data system.
- A detailed specification has been provided that identifies how system security will be implemented.
- A detailed specification has been provided that identifies how the system will manage spatial data and integrate with Geographic Information Systems (GIS).
- Adjustments have been made to allow the system to support the needs of observers.
- Adjustments have been made to provide an option to collect basic financial information.
- Adjustments have been made to integrate the use of a commercial onboard application. This application is being provided by one of the CRADA partners.
- Alteration of the database design to include collection of observer data.
- Alteration of the design to include a way to manage changing definitions of market categories and to incorporate the sampling that is used to validate the actual statistical composition of market categories.
- Alteration of the database design to include marine mammal sightings and the reporting requirements for fishing activity interactions with endangered, threatened or protected species of birds, mammals, amphibians, or reptiles.

The final design for a system will support the needs of the commercial WOC trawl fisheries and holds the potential to complement other fisheries management efforts that are ongoing around the country.

2.0 ELECTRONIC FISH CATCH LOGBOOK OPERATIONAL CONCEPT

Stage I of the EFCL project identified user needs, existing data collection systems, and available technology. Functional attributes of the prototype EFCL were identified for use as the foundation of the EFCL system design.

These functional attributes were then analyzed during a functional decomposition in Stage II in order to identify all of the functions the EFCL system will need to perform. Three major functions were identified.

- Collect and Maintain Logbook Data including:
  - Vessel data.
  - Trip data.
  - Catch data.
  - Landing data.
  - Observer data.

- Support Information Analysis:
  - Reproduce paper transactions.
  - Provide analysis reports.
  - Maintain historical records.
  - Support electronic interfaces.
  - Provide access to external information.

- Maintain the System:
  - Control access.
  - Provide historical integrity.
  - Maintain master data.

A detailed list of the functional requirements of the EFCL system is provided in Appendix B.

In addition to the functional requirements the system design must also support the many steps of the commercial fishing process (see Appendix C for description of the process). The following is the concept of operation for the EFCL. Figure 1 provides an illustration of this operational concept.

In the West Coast groundfish fishery, trawl fishers using Limited Access Permits are required to report fish catch information via the standardized WOC logbook. As processors receive these catches, they are required to collect and report information on the fish ticket that identifies the quantity and value of fish landed. The fish ticket is used to record payments to the fishers, and is the basis for reporting taxation. Researchers and state and federal resource managers use all this information.

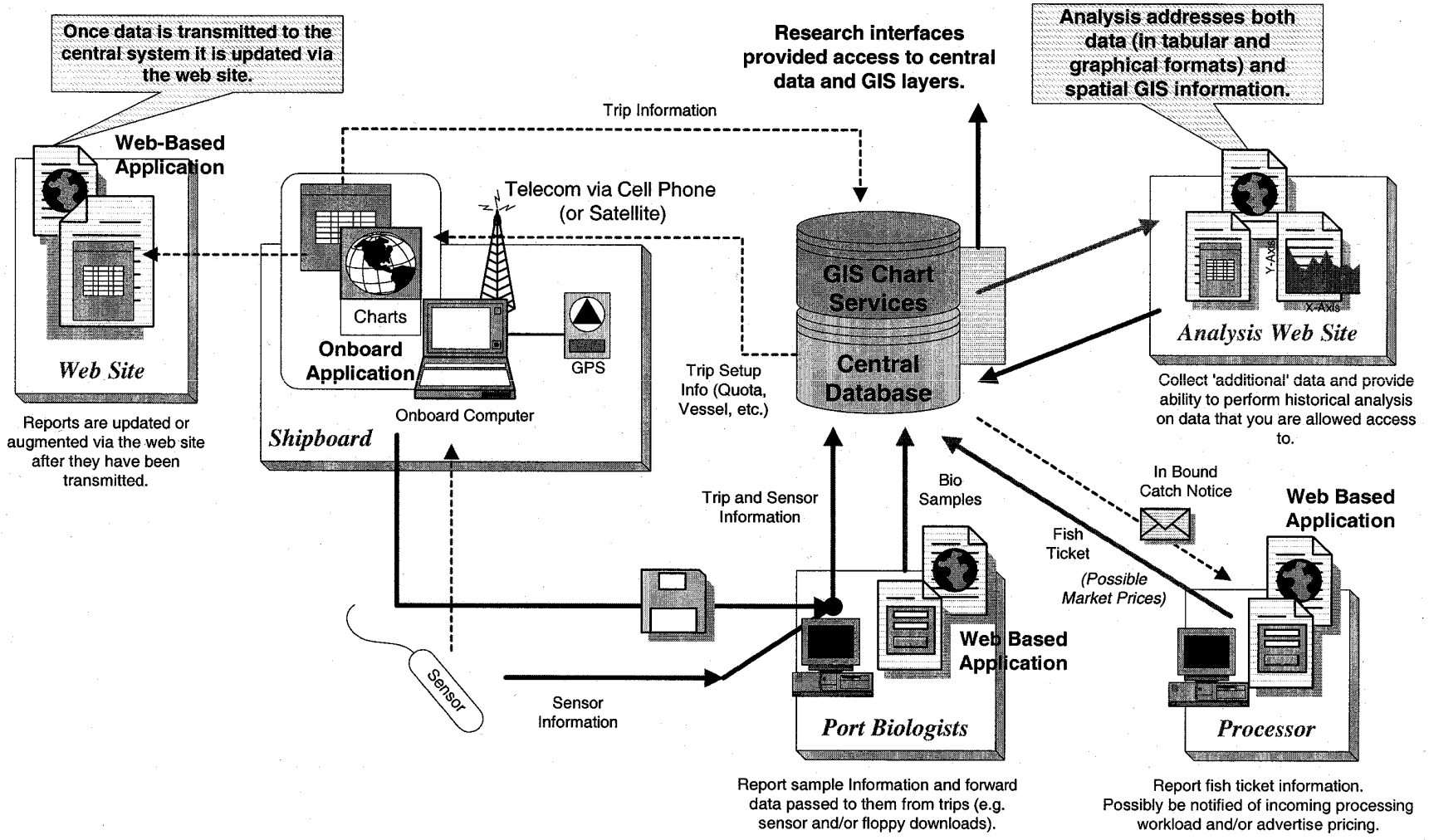


Figure 1. Operational Concept Diagram. GPS = Global Positioning System. GIS = Geographic Information System.

2.1 Operational Guidelines

2.1.1 Provide Desktop or Laptop Device

The intent of providing a device for the prototype is to use this as the basis for specifying computer requirements for fishers who would use their own devices. Therefore this machine will need to be a "real world machine."

2.1.2 Establish a Telecommunications Link

There is the potential to establish a telecommunications link via cell phone at 14.4 Kb or an Inmarsat-C connection. It may be possible to establish a satellite connection at a higher bandwidth, but the majority of West Coast fishers would be able to support cell phone connections. In light of this, the onboard device for the prototype will use a cell phone modem. Work to integrate with an Inmarsat-C satellite system will also be completed for demonstration purposes. Because of the anticipated bandwidth limitations, the onboard systems will be designed to operate autonomously, with the potential for connection as necessary. It is expected that telecommunications needs for a trip be economized to limit additional costs.

2.1.3 Connect a GPS Device

A global positioning system (GPS) device connected to a personal computer (PC) will provide a running "trace" of location data as well as date/time stamps for the fish-catch location points. This system will be separate from navigation GPS systems that are already onboard to provide an independent system during the demonstration phase. In fisheries where a VMS is in place, some GPS information could be obtained from the VMS GPS system if the regulations permit.

2.1.4 Use Independent Sensors

Sensor devices that operate independently and collect data only during fishing activities will be "plugged in" at a later point (either by fishers or official port biologists) and the collected information will be downloaded. The collected information will include date/time stamps that will be used to synchronize with other data sources.

2.1.5 Collect and Cache Trip Information

The onboard application will collect and cache all information for each trip and will include necessary chart information (base maps) to ensure that this high bandwidth data does not need to be transmitted. The application will be capable of downloading part or all of the information via a telecommunications link and/or preparing a data download that can be off loaded to a 3½"

floppy for later transfer to the data source (by either the fisher or the official port biologist).

Although the application will store all information associated with activities in preparation for and during a trip, it will not provide a repository for all historical information associated with a skipper or vessel. Because logbook records must be maintained on the vessel to satisfy enforcement regulations, the system allows for this historical data to be loaded into the onboard application as part of the trip initialization. The amount of historical information will depend on the regional requirement and will be regionally configurable. The onboard application will support reporting against this information.

Once data relevant to a trip has been transferred to the central data system, the website will be used to make updates and to perform analysis. Authorized users will be able to make a copy of the data to retain, and they will be able to retrieve data from the website, or via database-to-database interfaces to the central system.

2.1.6 Pre-load the Application

If fishers establish a connection at the outset of the trip (or early on), the system will provide the ability to load information to the vessel regarding their quota status, vessel information, etc. The onboard application will be able to support keyed entry of this information or changes in vessel information.

2.1.7 Share the Application

The onboard application could be shared by the skipper and an observer for entry of required information. In the event that only one computer is available on a vessel, the onboard application will allow for the skipper and an observer to enter their data independently. They would share the vessel and crew information and maintain their own trip information. This information would be independently packaged for transmission to the central system. Once packaged both the skipper and observer transactions could be sent when a connection to the central database was established.

2.1.8 Use Website for Data Collection

The website will provide for collection of data from processors (e.g., a fish ticket), and official port biologists or observers regarding the samples that they take. Collection of fish ticket information will allow for more efficient reconciliation with information provided in the logbooks. Collection of biological sample data will allow for clear association and audit trails regarding catch estimates, fish tickets, and samples.

Fishers can notify processors of incoming catches. Collection of incoming catches will be dependent on the fishers using telecommunication connections to call ahead with the necessary information.

2.1.9 Store Data in Central System

Whether data is collected via the onboard application, or via the web, the data will be stored in a central data system. The website will provide access to key historical analysis reports and the data system will be constructed to allow direct interfacing to other data systems.

2.1.10 Use Analytical Website Features

The website will provide the ability for fishers to update information they provided via the onboard application and to report extra details regarding their trip (i.e., economic information). The focus of this site will be to allow analysis of historical information.

Because of the analytical nature of the website features, and the subsequent bandwidth demands these create, it is expected the predominant use of the website will be shore-based (i.e., via land-based telecommunications connections capable of 28.8Kbps – 56Kbps bandwidth). With an adequate bandwidth telecommunications link, this portion of the website may also be accessed and used while offshore.

2.1.11 Use "Bulletin Board" Features

Though the initial focus will be on collecting catch and fish ticket information, the website can also provide the ability to post general information that may increase the value of the site to commercial fishers. Information that could be posted includes: weather, tide, and safety information, family e-mail contact, postings for job offerings to support crew hiring; and pricing information on fish (offered prices from the processors), diesel, or other commodities.

2.1.12 Share System Components

To minimize system maintenance costs, the onboard application and the update capabilities of the website should share code and components where feasible. Efforts will be made to provide a similar look and feel to both. In addition, when possible we will attempt to re-use components between the onboard application and the data maintenance section of the website.

2.1.13 Secure the System

The system will incorporate a security model that is analogous to a banking system. Information regarding discrete fishing trips will be available only to the skipper for that trip. In the event that the skipper is working for a permit holder, and the parent company wishes to audit the skipper's "account," that group may be given partial or complete access as defined by the skipper. The entire system of data will be available to allow researchers to audit the health of the fishery.

2.1.14 Use the System Voluntarily

The system will be used on a voluntary basis and (at least initially) will not replace the current legal reporting requirements. While it is desirable that the electronic reports made to the system are treated as a viable alternative to the current manual methods, the necessary policy and legislative changes to accomplish this are within the jurisdiction of state agencies. In light of this, the system will be prototyped to demonstrate the feasibility of electronic reporting.

2.1.15 Allow Printing

This system will provide the ability for complete electronic storage of all information required by existing enforcement regulations (e.g., catch logs and fish tickets). If the skipper is required to produce paper documents, there can be options for the enforcement agents to either retrieve them online or for the skipper to use a printer to print them on the vessel. Enforcement agents may be given access to electronic records instead of paper records if regulations and policies allow. Some skippers may prefer to print and maintain hard copies of their logs on the vessel.

3.0 SYSTEM ARCHITECTURE

To support the systems-defined functional requirements and commercial fishing process, it is necessary to develop a system architecture that provides for the operations defined in Section 2.0.

To provide a flexible design that can be adapted to different situations, the architecture for the EFCL system is broken into a number of subsystems, functional modules, and components. The subsystems represent an application or suite of technology that will be implemented. The modules are the groups of forms, pages, and/or functional capabilities that will be built to support an area of functional need. Figure 2 provides a definition of the logical architecture for the system.

Figure 2 shows the system made up of three subsystems: the onboard application, the Central Database Connection (CDC), and the web application. Figure 3 shows the physical system architecture.

Onboard the fishing vessel, an application will collect all information and provide reports to the fishers while they are at sea. Since there will not be a persistent telecommunications link, this application must be capable of being initialized with all necessary data, and then caching all data related to the trip. Data that is onboard must be secured, and there must be assurances that the data is not tampered with outside the authenticated access granted by the application.

Data will be reported to a central system. The central system uses the CDC subsystem to manage all communications between the central system and the deployed onboard systems. This middle tier subsystem is responsible for receiving and processing transactions from each of the vessels. Once a transaction is received and validated, this subsystem will then respond by returning either a confirmation or the requested information to the vessel's onboard subsystem.

Data will be transmitted between the CDC and the onboard system on an as-needed basis. This data reflects information used to prepare for a trip and to report about a trip. This data will be passed in a set of fixed records that facilitate EDI. Records have been defined in a manner to economize the volume of data that will have to be transmitted. In addition, the system makes use of its ability to cache information to allow skippers choice for what is transmitted and when. Skippers will be able to transmit a minimal amount of time-sensitive information while they are underway, and make use of more economical communications capabilities before they leave, and once they return, to transmit the higher volumes of information.

To secure the information, each transaction will be secured and signed with a public key certificate of both the identity of the person reporting, and the identity of the destination system (i.e., the CDC). By signing it with both of these, the transaction can be authenticated to the person reporting the information, and will only be useful if received at the CDC.

The web application provides a user interface for all access to the central system. Fishers, observers, researchers, and processors will make use of this subsystem as follows:

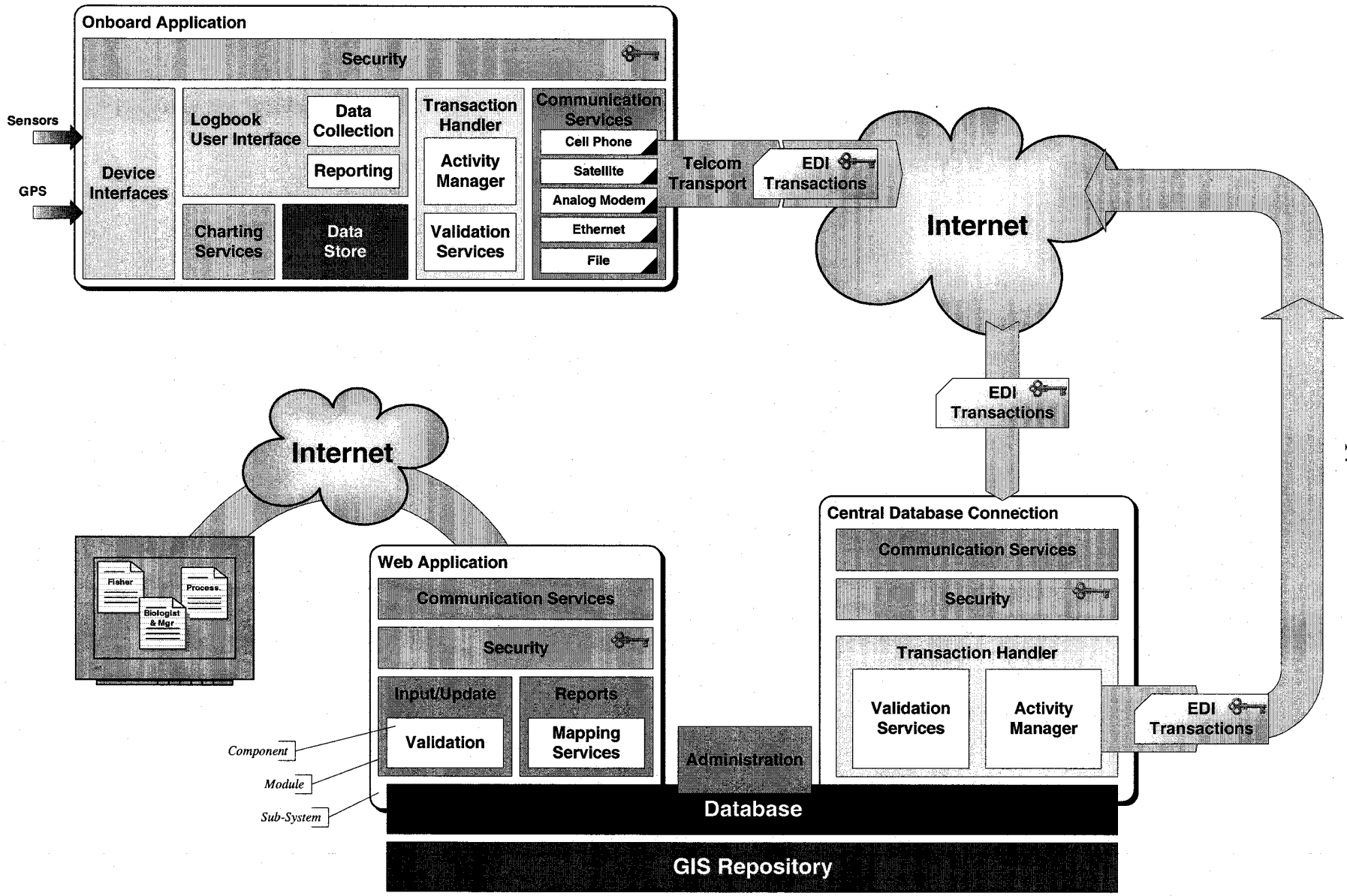


Figure 2. Logical System Architecture. GPS = Global Positioning System. EDI = Electronic Data Interchange. GIS = Geographic Information System.

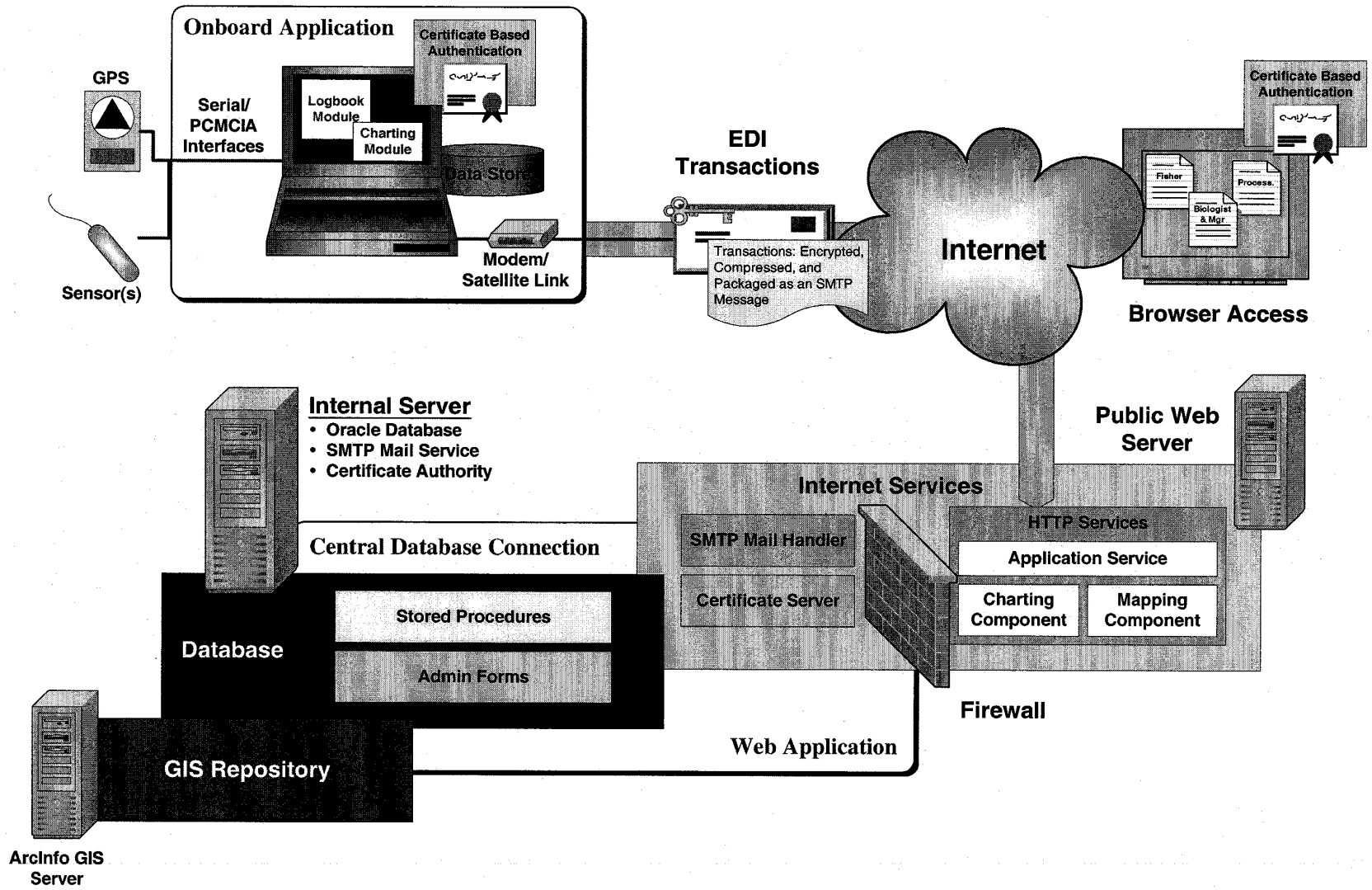


Figure 3. Physical System Architecture. GPS = Global Positioning System. EDI = Electronic Data Interchange. GIS = Geographic Information System.

- Fishers will access the subsystem to analyze information about their trips and to make business decisions.
- Observers will record activity witnessed on the vessel.
- Official port biologists will use the web subsystem to review fish tickets and logbook reports and deal with any necessary reconciliation between the reports.
- Researchers will use this subsystem to review, analyze, and report on data from multiple fishers. This will allow them to monitor overall trends in fishing activities and manage the resources.
- Processors will use the subsystem to report fish tickets.

The following provides a more detailed summary of each of the subsystems and their architectural components.

3.1 Onboard Application

The onboard application will be responsible for the collection and reporting of all information onboard the fishing vessel. The system will obtain a set of initialization information from the central system, and then will be responsible for collecting all information either from sensors, or via manual entry. Information that is collected will then be transmitted to the central system via the CDC subsystem.

The onboard application is made up of the following modules.

3.1.1 Security

This module controls access to the system. Users will be authenticated using public key certificates. When a user accesses the application, they will be asked to provide authentication in the form of a certificate and the applicable Personal Identification Number (PIN) – these will act as the username and password. This information will be managed as either a file on a system or via the use of a smart card.

These authentication credentials will be set up centrally when users request access to the system.

3.1.2 User Interface

This module will provide a graphical user interface to collect and report information. Information that will be reported will include data about the trip, the catch that was made, the gear used, and potentially the discards made. The user interface will tightly integrate with the charting service module to ensure that to an end user the two services will look as if they are one.
The system will provide reports that relate to the current trip. At the start of the trip, the system will be initialized with information about current quota status and the last 60 days of activity[2].

[2] For the Washington, Oregon, California EFCL – other fisheries may have different timing requirements.

The information about the last 60 days will be used to satisfy the enforcement requirement for fishers to hold 60 days of logs and fish tickets. This information, in conjunction with up to date quota status (calculated based on the initial status and any adjustments from catches made during the trip), will allow the system to provide fishers with information to make decisions about the strategy they will use to manage their operations.

3.1.3 Device Interfaces

Information from GPS and sensor devices will be collected from appropriate devices via Serial and Personal Computer Memory Card International Association (PCMCIA) interfaces. If the fishery is using VMS, and regulations permit, the sealed GPS device may be able to provide the needed location information.

3.1.4 Charting Service

This module will integrate navigational charting services with the overall onboard subsystem. The logbook application is being developed in a way that will plug directly into one specific commercial charting service, but will also allow other commercial charting services to integrate their systems into the onboard subsystem. The intent is that an object linking and embedding custom control (OCX) will be provided to support the user interface and other onboard modules. This OCX will have methods and properties defined in an open application program interface (API) standard that will be made available to charting service vendors as a development kit. It is hoped that this approach will allow the system to operate with different charting services, so that fishers can continue to use the service with which they are familiar.

The current proposal is for the initial pilot system to be developed with a single commercial charting system, and based on the results of this, the development kit will be released. Use of the new standard with other charting services will be incumbent on other charting service vendors.

3.1.5 Data Store

The system will be initialized with enough historical data to satisfy the legal enforcement requirements and a set of master data that will be used throughout the application.

The system will be responsible for securing the data store so that it is only accessible via the application and only to authorized users. The data store will be managed in an encrypted and/or password protected format so that it will prohibit tampering with the data from outside the application. As described above, the application will authenticate all access to the system and will keep an audit trail of data modifications that are made through the user interface module.

3.1.6 Data Initialization and Data Management

While the system has a potentially significant volume of data to manage for each trip, an important requirement is the need to manage the need for data transmissions to ensure that a cost efficient system is delivered. Because some fishers might have to use the system via satellite communications links while underway, it is critical that the system manages data transmissions in several stages.

These units may have transmission costs as high as 1-2 cents/character, but costs are coming down rapidly because of increased competition.

3.1.6(a) Master data

- One of the highest volumes of information transfer will be the initialization of the master data tables. The initial data will be loaded with the application.
- To manage updates, the onboard subsystem will track the last time that updates were made, and will work with the CDC subsystem to identify only the discrete updates that need to be made.
- Updates to this information will be able to be made while shore-side using more cost efficient data communications.
- This information will be retained and there will be no need to erase it once the software has been installed.

3.1.6(b) Initialization data

- Because information about a vessel or its gear will only change occasionally, the system will provide for the ability to initialize this information at the start of each trip. The initialization of this information will be done in conjunction with the load of the records for activity over the last 60 days.
- Because this is a potentially high volume of information, the system will make provisions to allow this data to be loaded prior to the start of a trip so that more cost efficient land based telecommunication techniques can be used.
- Because it is possible that a vessel may be manned by more than one skipper, the system will provide the ability to wipe out this data at the end of a trip so that it is not accessible to other skippers using the vessel or its computing equipment.

3.1.6(c) Trip data

- The key data that describes activity during a fishing trip is the information about what was caught and the environment in which it was caught. This information is collected via the User Interface, Device Interface(s), and the Charting Services modules.
- This information will be more time sensitive, and therefore may be sent to the central system in interim transmissions during the trip.
- Likewise, the system will also allow the skipper to cache all information and transmit it at the end of the trip if desired. Since there are time stamps associated with many of the data points, the integrity will be preserved.
- Since this is the most sensitive information, it is expected that this information will need to be

purged from the system at the end of each trip.

3.1.7 Transaction Manager

As discussed above, EDI transactions have been defined to support all communications between the central system and the onboard subsystem. The transaction handler will be responsible for constructing and interpreting all of these transactions. As the system prepares a transaction for transmission, this module will assemble the information into the appropriate format and will use the Cryptography API to ensure the transaction is secured and signed appropriately.

As part of the master data, the system will maintain a record of the public keys for all valid users known within the WOC region. In the event that a user presents a private key that does not have a known public key, the system will prompt them to make a connection with the central system to validate if an updated public certificate is available.

This module will be responsible for validating that transactions received are valid and then initiating the appropriate action by the onboard subsystem.

3.1.8 Communication Services

Once a transaction has been assembled, secured/signed and compressed, the system will use messaging application program interface (MAPI) calls to send the transaction as a Secure multi-purpose internet mail extensions (S/MIME) message to the simple mail transfer protocol (SMTP) mail service resident in the central system.

The onboard subsystem will use Telephony application program interface (TAPI) calls to access dial up network services at the Microsoft Windows operating system level, establish a connection to an Internet connection point, and then transmit the transaction(s).

3.2 Central Database Connection

The central system serves as the central collection point for all information. To load information to this system, the system makes use of the CDC subsystem, which is made up of the following modules.

3.2.1 Communication Services

Messages will be received via an SMTP mail handler. Public Domain Name Service (DNS) entries will allow the mail to be directed to the mail service based on addressing in the mail header

that was constructed by the onboard application.

3.2.2 Security

Once a message is received and decompressed, the application on the server will periodically check the SMTP mail service and retrieve all new messages. Using the public key available via the local certificate server and the private key for the server, each message will be authenticated, decrypted, and all transactions contained within will be extracted.

3.2.3 Transaction Manager

As discussed before, EDI transactions have been defined to support all communications between the central system and the onboard subsystem. The transaction handler will be responsible for constructing and interpreting all of these transactions. As the system receives a transaction, this module will interpret and validate the contents of each transaction. Once a transaction has been validated, appropriate action will be taken. Data will be stored in the central database. As necessary, a new transaction will be constructed based on information in the central database.

These transactions will be transmitted as secure MIME mail messages that will be addressed to the vessel. As a vessel connects, it will transmit any outstanding transactions/messages and check for new messages.

Each transaction specification identifies the validation criteria and the actions to be taken based on the validation results. Most transactions will issue either a response, or a confirmation.

3.3 Web Application

3.3.1 Communication Services

The web application will make use of standard hypertext transfer protocols (HTTP). Users will make use of standard browsers to access the website.

3.3.2 Security

Authentication to the website will be managed via the same public key certificates that are used throughout the system. Users will register the certificate in their browser, and then the site to authenticate access will use the certificate.

A certificate server that is managed by the project will grant certificates for users. Each certificate will identify the user, so that as they access the site, they will be presented with access to the

portions of the site that applies to their access profile.

3.3.3 Input/Update Module

Fishers, researchers, resource managers, observers, official port biologists and fish processors may make use of the site to provide inputs or updates to the system. Fishers may report economic information as well as update trip information. Observers may provide additional trip information as well as sample information. Processors may report fish tickets. Official port biologists may review logbook entries and associated fish tickets and then reconcile discrepancies.

All of these functions will be performed using web-enabled forms that will be available via the website. When a user enters the site, depending on the access profile established for them, they will be presented with alternatives to access one or more sections of the site.

3.3.4 Reporting Module

The primary function of the website will be to provide access to reports that will help different groups of people analyze the data that is collected. The site has been constructed to provide reports to assist different groups of people complete their work.

Mapping services will provide output so that information can be mapped to where the fishing activity took place. In addition, charting services will be used to provide graphical charts to help analyze the data.

3.4 Physical Architecture

Figure 3 illustrates the physical technology components that will be used to prototype the system. The following systems are involved.

3.4.1 Onboard Application

This subsystem is completely housed in a computer that is onboard the fishing vessel. The computer will house a set of applications that provide the user interface, and the charting services. There will also be a GPS device that provides a real-time feed to these modules to allow recording of vessel positions.

The user interface will be developed as a Visual Basic Application that is compiled as an OCX. A defined set of methods and properties will be exposed so that other charting services can make use of the logbook portion of the system.

Information gathered will be stored in a Microsoft Access data store. Information in the data store will be initialized via transactions that are transmitted via different options for

communications devices. The communications devices will be controlled by Windows device drivers and will be accessed via TAPI calls to the Windows (Dial-Up) Networking services.

Transactions will be constructed as signed and secured S/MIME transmissions that are sent to an SMTP mail service that is run in conjunction with the central systems. MAPI calls will be made by the onboard system to construct, transmit, and handle these messages.

Response transactions will be addressed to the vessel and will be handled by the onboard subsystem. When the onboard application connects to transmit a set of messages/transactions, it will also check for new messages addressed to that vessel. The Transaction Handler module will be responsible for processing these new transactions.

3.4.2 Internet Services

The central system will have a server that provides a set of Internet services. These services will include SMTP mail services, public key Certificate services, and HTTP web services.

The server will need to provide SMTP mail services for sending and receiving the S/MIME messages that contain transactions. All messaging traffic will be addressed to the Server's SMTP mail service, which will have a public DNS entry for the mail exchange (MX) record. This entry will ensure that messages sent to the server will be able to be routed via an Internet provider.

The server will also perform as a public key certificate authority. As described in the security guidelines for the system, certificates will be issued to users as they apply for access. These certificates will be used to authenticate users to all aspects of the system.

The central server will be granted a certificate from a third party so that its credentials can be validated, and messages can be secured for access only by itself. The use of the server's public key will ensure that another party cannot intercept information.

The server will also provide HTTP services to support the web application. To do this, there will be extensions to the HTTP services to allow complex forms processing and use of server-side components to provide charting and mapping output in the web application.

3.4.3 Oracle Database

The central system will house an Oracle database that is separate from the server hosting the Internet Services. A firewall between these two devices will secure the information housed in the database.
The database will be the central repository for all information collected as transactions or input/updated via the web application. The data system has a data model that will support statistical analysis by researchers, as well as providing the necessary links to the spatial repository contained in the Environmental Systems Research Institute (ESRI) GIS repository.

3.4.4 GIS Repository

The ESRI GIS repository will contain base maps and coverages that apply to the activities reported in the central data system. The ESRI Spatial Data Engine (SDE) will be used to link the ESRI repository and the Oracle data system. In addition, ESRI MapObjects will be used as the server-side component to provide mapped output via the website.

4.0 Specifications

4.1 Database Specification

The database specification contains the details of the system architecture – a "picture" of how the different parts of the data system are connected. The database design has been developed in an Oracle Designer 2000 Case repository.

As a result of our review of the other initiatives (ACCSP, Alaska At-Sea Observers, VMS, etc.), and discussions with interested groups and individuals, numerous changes have been made to the logical database design. Appendix D contains the physical database design and table structures. A summary of the tables in the database follows.

4.1.1 Entity Groupings

The database entities listed below are grouped together by similar function within the logical database design. A brief description of each grouping and entity follows.

4.1.1.1 Vessel/Person Information

This grouping contains the entities that deal with vessels and people or organizations.

4.1.1.1(a) Vessel—This entity contains the vessel or boat information used to catch fish.

4.1.1.1(b) Participant—This entity contains the individuals or organizations involved in the harvesting and/or processing of fish.

4.1.1.1(c) Vessel Ownership—This entity shows information about the ownership for a vessel. Any number of participants could hold this ownership in any percentage amount.

4.1.1.1(d) Participant Role—This entity contains the roles that a person holds. These roles currently are skipper, crew, owner, observer and other. Additional roles could be added in the future as the need arises.

4.1.1.2 Permit Information

This grouping contains the entities that deal with permits, the authority to fish, and the agency granting that authority.

4.1.1.2(a) Issuing Authority—This entity contains information about the Government Agency either, Federal, State, or Local that issued the permit or license.

4.1.1.2(b) Permit License—This entity contains information about the legal documents allowing a participant to harvest fish.

4.1.1.2(c) Quota Share—This entity contains information about the amount of quota shares held by a participant.

FIGURE 4: Vessel/Participant Entity Relationship Diagram (ERD)[3]
Figure 4 identifies the tables that will be tracked to manage data about vessels, participants, and the quotas and permits that may apply to them.

This diagram is in the form of an ERD, which defines, tables, and the columns for those tables as entities, and the attributes that define the entities. In addition, an ERD provides a means of defining the relationship between the different data within the system.

4.1.1.3 Trip Information

This group contains the entities that deal with a trip: ports visited, the role assigned to a participant, markers placed, protected species encountered, and the amount of quota resulting from quota share.

4.1.1.3(a) Trip—This entity contains the information about a fishing trip. A fishing trip consists of a departure port and time, at least one fishing activity, and a final landing port and time.

4.1.1.3(b) Marker Location—This entity contains information about markers and their location. A marker can be any information that the skipper might want to note.

4.1.1.3(c) Trip Port—This entity contains the information about the ports of call for a vessel.

4.1.1.3(d) Quota Share Trip—This entity contains the information about the amount of quota shares held by a participant that can be fished during a trip.

4.1.1.3(e) Participant Trip Role—This entity contains the specific role that a person holds while on a fishing trip.

4.1.1.3(f) Protected Species Sighting—This entity contains information about the sighting of protected species.

[3] Because the ERD for the system has over 60 entities, it is impractical to provide the entire system ERD in a single readable format with this document. Pieces of the ERD have therefore been provided within this section of the document. If an entire system ERD is required, please contact the Principal Investigator for the project.

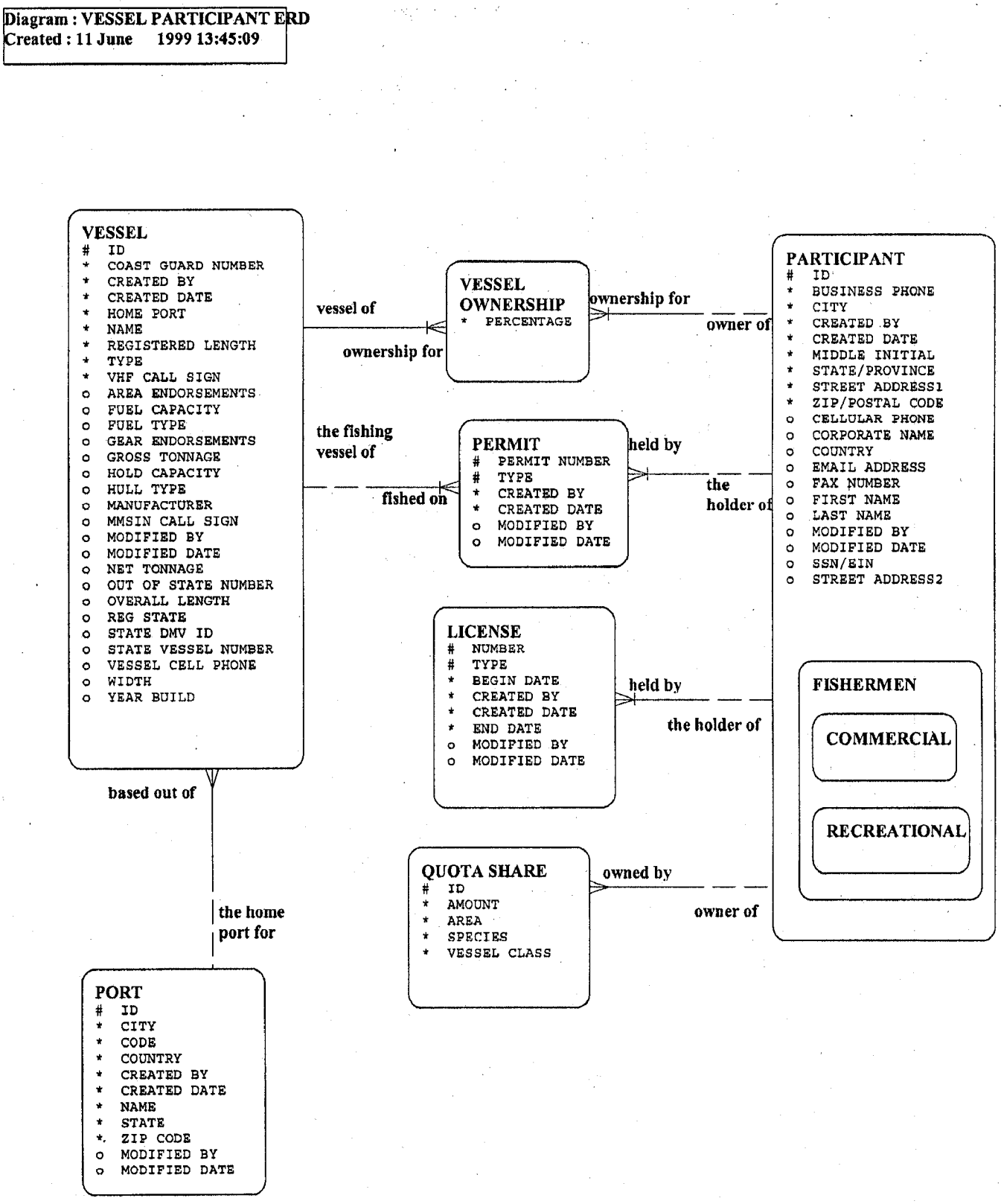


Figure 4. Vessel Participant Entity Relationship Diagram.

FIGURE 5: Trip ERD
Figure 5 identifies the tables that will be tracked to manage data about trips, roles, ports, markers and protected species sightings.

FIGURE 6: Species, Catch and Permit ERD
Figure 6 identifies the tables that will be tracked to manage data about species, catches and permits.

4.1.1.4 Fish Catch Information

This group contains the entities that deal with the catching of fish: the fishing activities and locations, the fish catch, the gear used, the gear configuration, and environmental information.

4.1.1.4(a) Fishing Activity—This entity contains information about a specific fishing activity. A fishing activity consists of a fishing activity starting time and location and an ending time and location. In the case of a tow, the start is determined when the vessels winches are locked in place. The end of the tow is when the winches start the haul back.

4.1.1.4(b) Fishing Activity Location—This entity contains the longitude and latitude points for a vessel at any given point in time during a fishing activity.

4.1.1.4(c) Catch—This entity contains information about the fish caught during a specific fishing activity.

4.1.1.4(d) Environmental Sensors—This entity contains information about the data related to the environmental sensors installed on the vessel.

4.1.1.4(e) Sensor Reading—This entity contains information about the data obtained from the environmental sensor(s) installed on the vessel.

4.1.1.4(f) Gear Value—This entity contains information about specific settings for a gear characteristic.

4.1.1.4(g) Gear Alias—This entity represents a grouping of gear characteristics and values that make up, for example, a net. This group of characteristics is given a number and a name.

4.1.1.4(h) Fishing Activity Gear Value—This entity is the combination of a set of gear values that are associated with a fishing activity.

4.1.1.5 Observer Information

This group contains the entities that deal with the interaction of protected species in fishing activities.

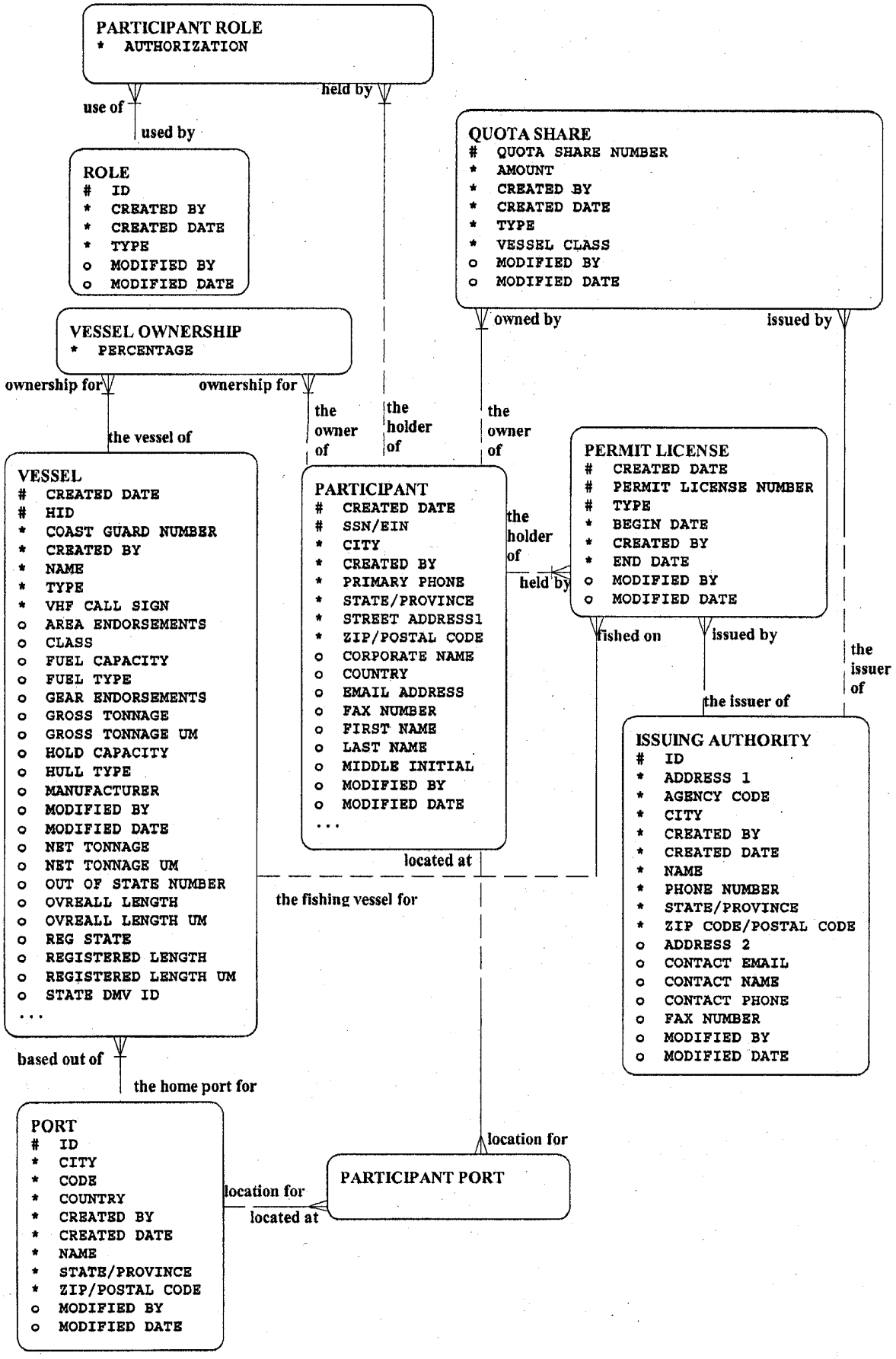


Figure 5. Trip Entity Relationship Diagram.

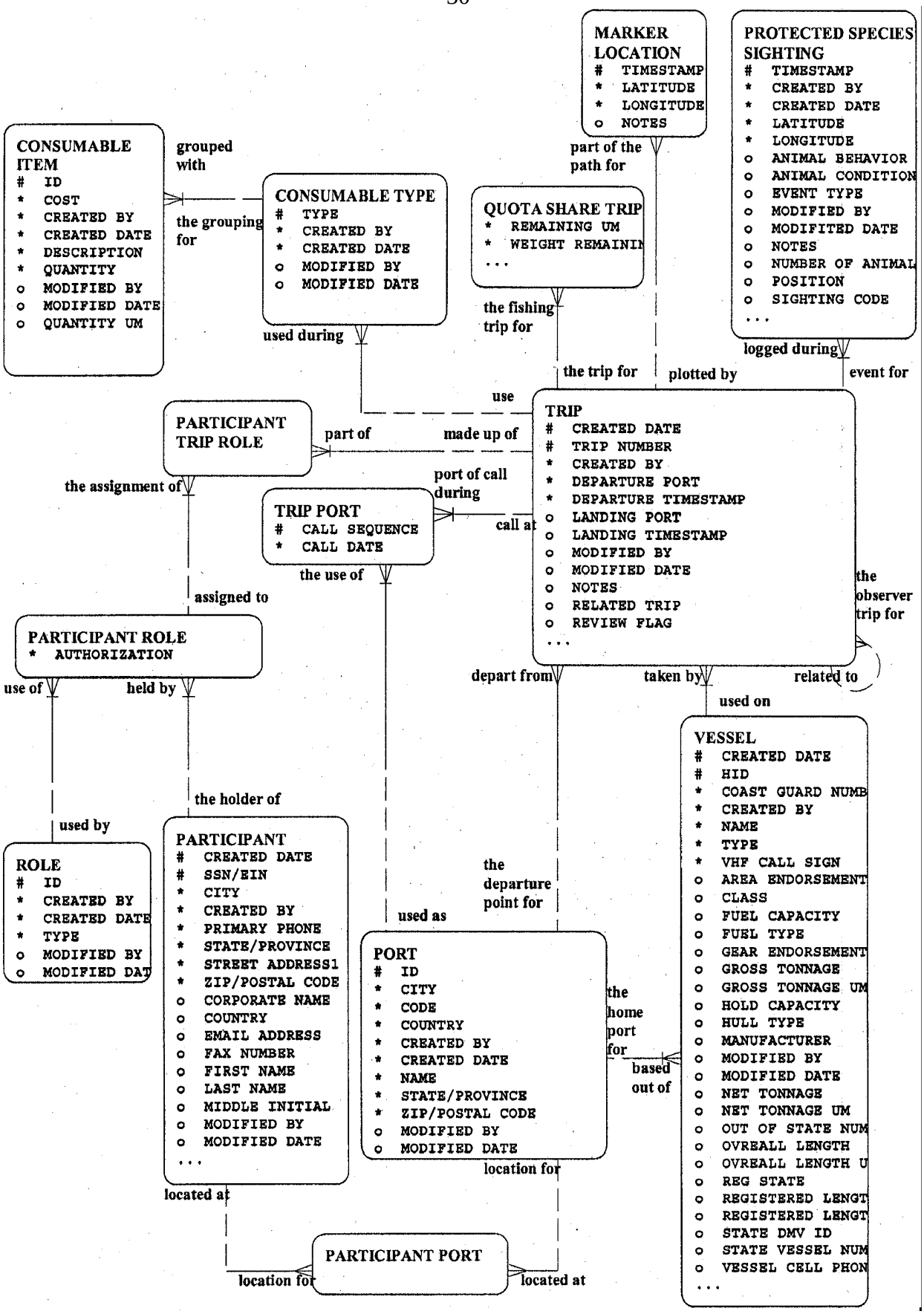


Figure 6. Species, Catch, and Permit Entity Relationship Diagram.

4.1.1.5(a) Protected Species Incidental Take—This entity contains information about the take of a protected species.

4.1.1.5(b) Protected Species Characteristics—This entity will contain the protected species characteristics associated with the selected protected species type. The protected species value will contain the characteristic data.

4.1.1.5(c) Protected Species Value—This entity contains specific specimen information about the taking of a protected species.

4.1.1.5(d) Tag—This entity represents the tag information that is retrieved from an animal that is caught.

FIGURE 7: Fishing Activity ERD
Figure 7 identifies the tables that will be tracked to manage data about fishing activities and locations, the gear used, environmental information and protected species takes.

4.1.1.6 Landing Information

This group contains the entities that deals with a fish catch landing and its details.

4.1.1.6(a) Landing—This entity contains information about the fish caught during a trip that are landed at a dealer/processor.

4.1.1.6(b) Landing Detail—This entity contains information about the detail lines on a fish ticket. These lines will contain the categories of fish landed the number of pounds landed and other pertinent information.

FIGURE 8: Landing ERD
Figure 8 identifies the tables that will be tracked to manage data about landings.

4.1.1.7 Sampling Information

This group contains the entities that deal with biological samples and the individual specimen information.

4.1.1.7(a) Sub Samples—This entity represents the individual sub samples that are taken at the time of landing or as catch is brought onboard a vessel.

4.1.1.7(b) Species Composition—This entity represents each species from a sub sample and its related information.

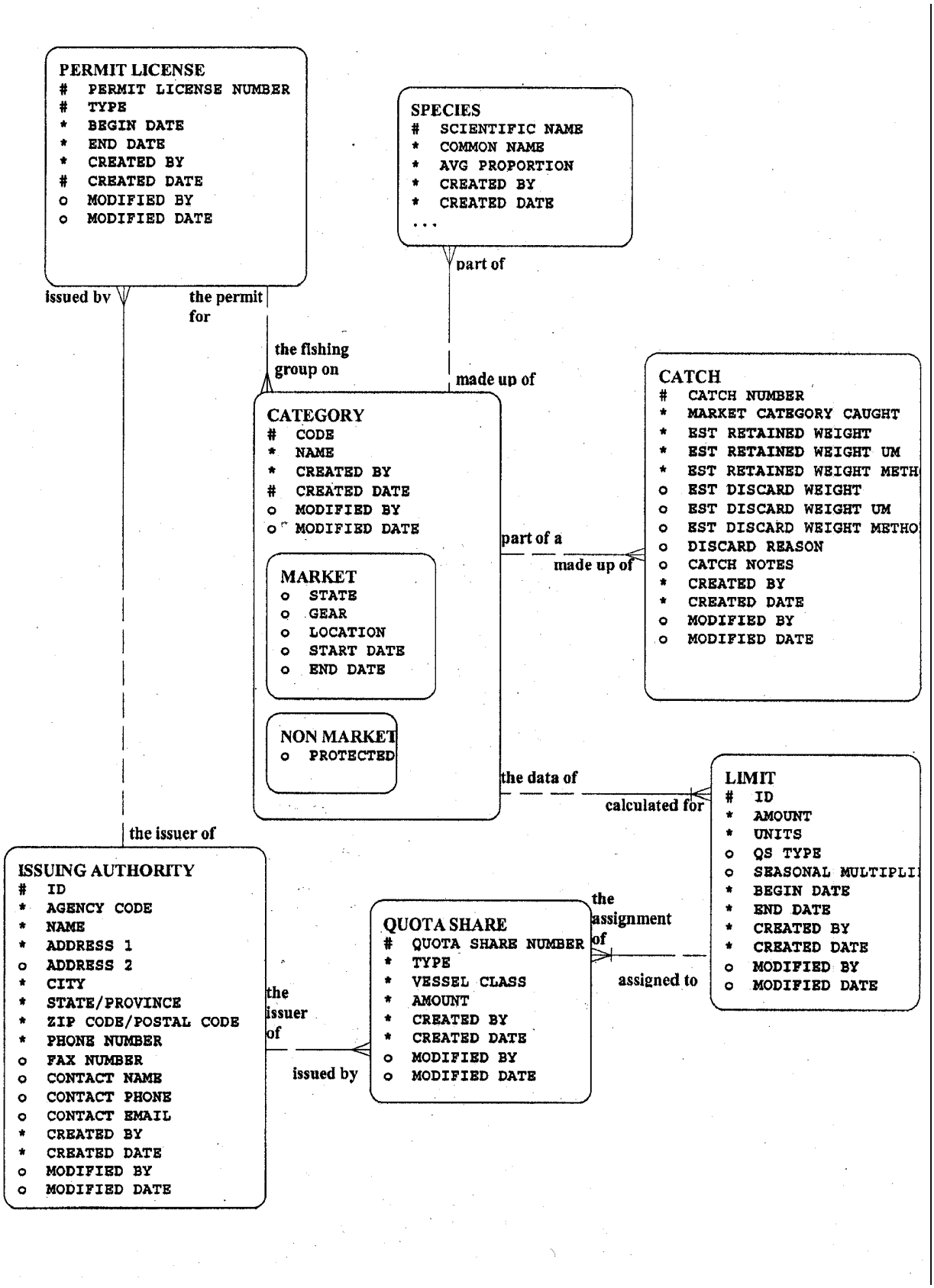


Figure 7. Fishing Activity Entity Relationship Diagram.

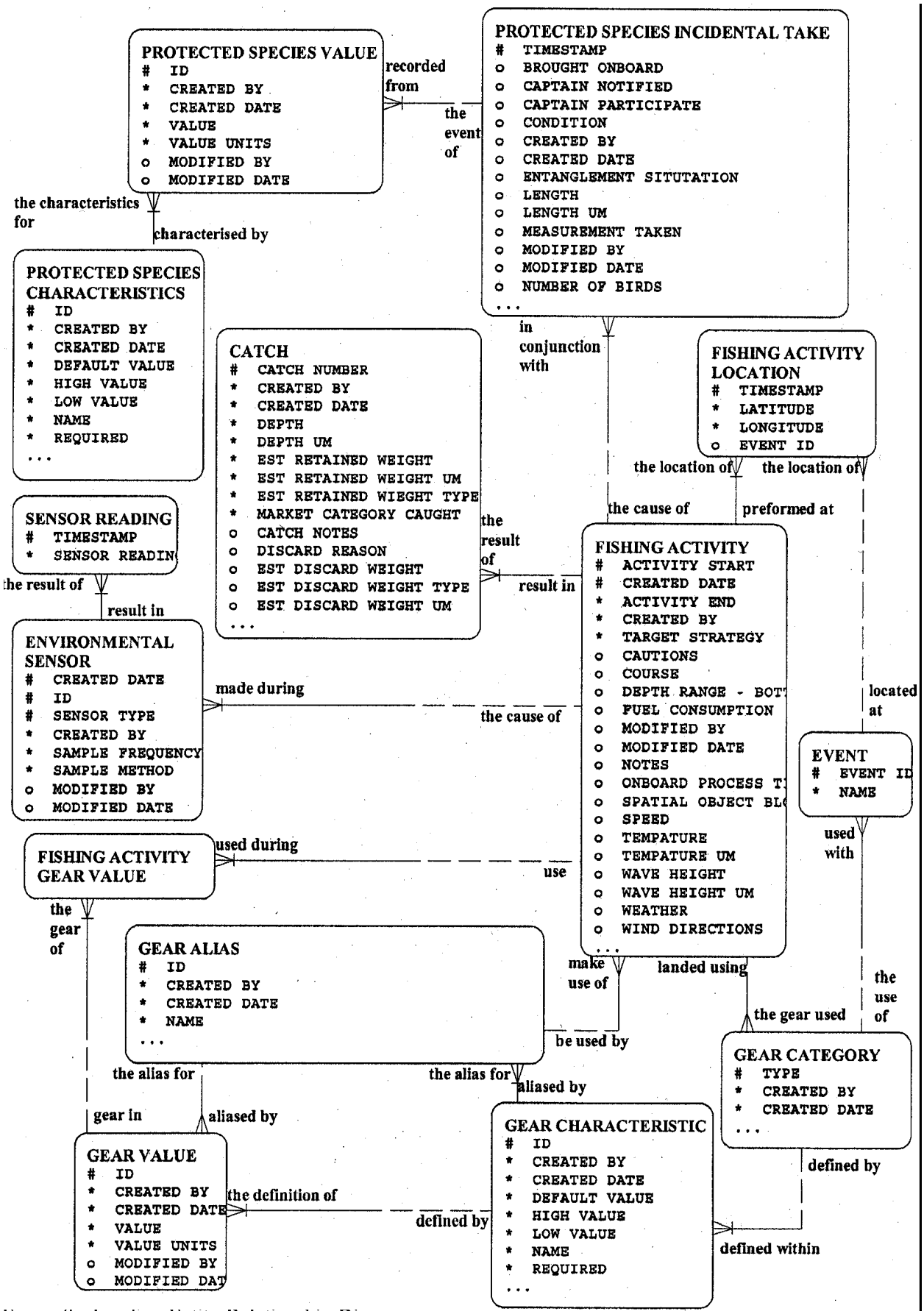


Figure 8. Landing Entity Relationship Diagram.

4.1.1.7(c) Biological Specimen—This entity represents each individual fish in a species. Detailed information will be collected from or about each specimen.

4.1.1.7(d) Specimen Characteristics—This entity will allow for the collection of regional information about an individual specimen. This information might be dissection information or stomach content. Each region/agency will be able to specify what information is collected.

FIGURE 9: Biological ERD
Figure 9 identifies the tables that will be tracked to manage data about sub samples, species compositions, biological specimens and specimen characteristics.

4.1.1.8 Master Information

This group contains the entities that deal with the regional data required to manage a fishery or group of fisheries.

4.1.1.8(a) Event—This entity contains information about events that occur during a fishing activity. These events are specific to a gear category.

4.1.1.8(b) Gear Category—This entity contains information about specific categories of gear, its deployment, or bait used in fishing. It might be a net used for towing, pots for crab or shrimp, or a longline soak. Gear categories are unique to individual fishing activity.

4.1.1.8(c) Gear Characteristic—This entity contains information about a specific gear characteristic within a gear category. The fisher might want to test out various configurations of gear characteristics. This will allow for the capture of these characteristics. The catches from these characteristics could be compared with other catches with similar configurations.

4.1.1.8(d) Species—This entity contains information about the species that may be subject to data collection. This combination is linked to common names to more easily identify fish.

4.1.1.8(e) Limit—This entity contains information about the amount of fish that can be caught during any one fishing period in the particular management area. Management areas have different quota amounts and rules depending on the regional circumstances.

4.1.1.8(f) Management Area—This entity contains information about a region of the ocean that has been setup as a specific regulatory area. These areas are used to regulate fishing activity.

4.1.1.8(g) Management Area Boundary—This entity contains information about the boundary information for a management area.

- **Polygon—**This entity contains information about the latitude and longitude points (at least 3) that define the polygon for a management area.

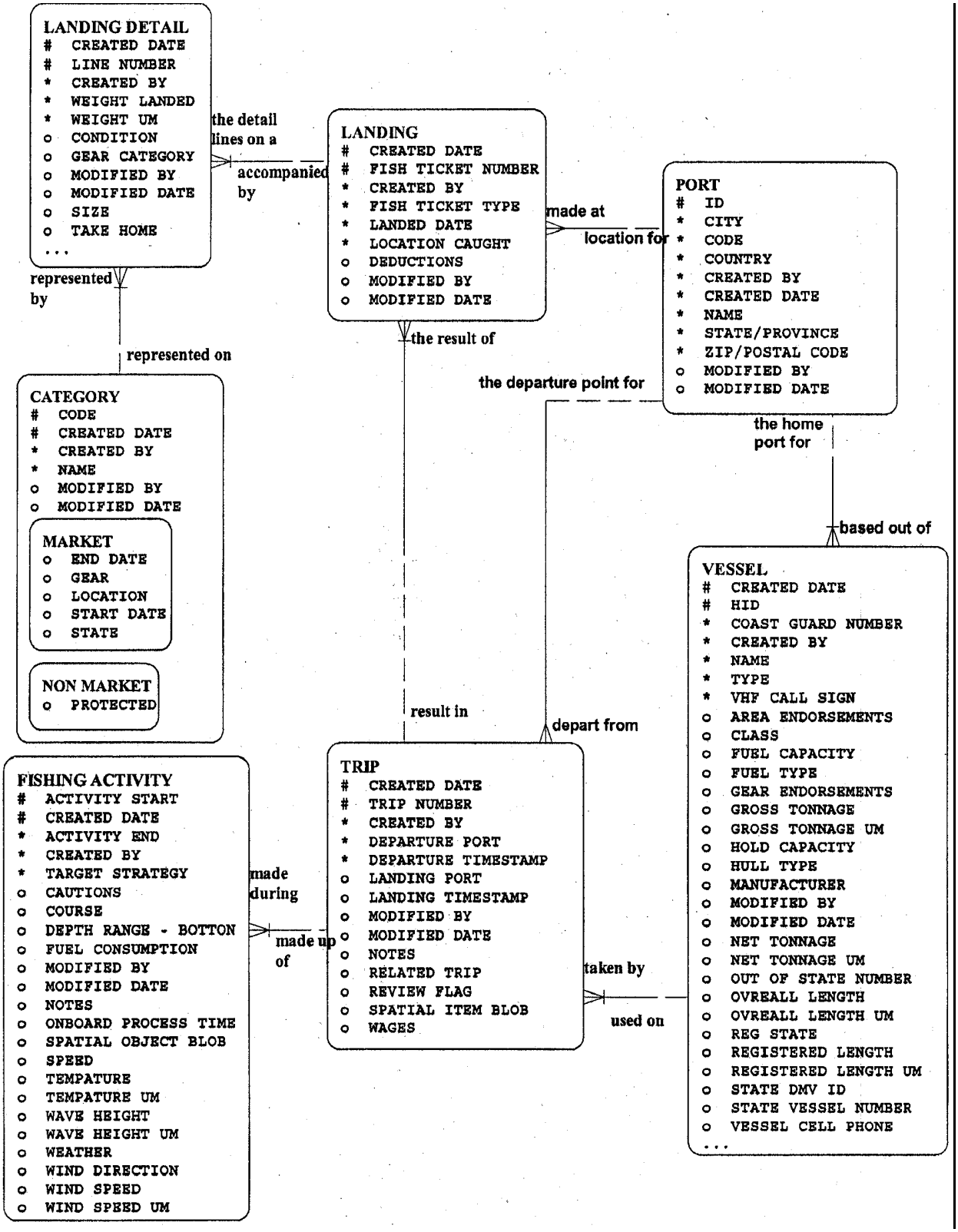


Figure 9. Biological Entity Relationship Diagram.

- **Offset—**This entity contains information about the offset applied to a region of coastline that defines a management area.

4.1.1.8(h) Port—This entity contains information about the vessel's home port where trips begin and end, or where fish are landed.

4.1.1.8(i) Role—This entity contains information about the roles that a participant can hold. The current roles are skipper, crew, owner, observer, and other. Additional roles could be added in the future as the need arises.

4.1.1.8(j) Category—This entity contains information grouped by market and non-market species.

FIGURE 10: Master Data ERD
Figure 10 identifies the tables that will be tracked to manage data about master data used in the system. *Note: master data not shown on this diagram is shown on previous diagrams.

4.1.1.9 Historical Information – No ERD Provided

This group contains the entities that deal with maintaining a history of changes made in the database. The system will retain an accounting of changes made to key data. This capability will be implemented via journal tables and views during system implementation.

4.1.1.9(a) Gear Category History—This entity contains historical information about specific categories of gear that was used in fishing. It might be a net used for towing, pots for crab or shrimp, or a longline soak. Gear categories are unique to individual fishing activity.

4.1.1.9(b) Gear Characteristic History—This entity contains historical information about specific gear characteristics within a gear category.

4.1.1.9(c) Fishing Activity Gear Value History—This entity contains historical information about specific gear values as they related to a specific fishing activity.

4.1.1.9(d) Species History—This entity contains historical information about the species. This combination is used in conjunction with common names to more easily identify specific fish.

4.1.1.9(e) Limit History—This entity contains historical information about the amount of harvestable fish that could be caught during any one fishing period based on the management area.

4.1.1.9(f) Management Area History—This entity contains historical information about a region of the ocean that was setup as a specific regulatory area. These areas are used to regulate the fishing activity.

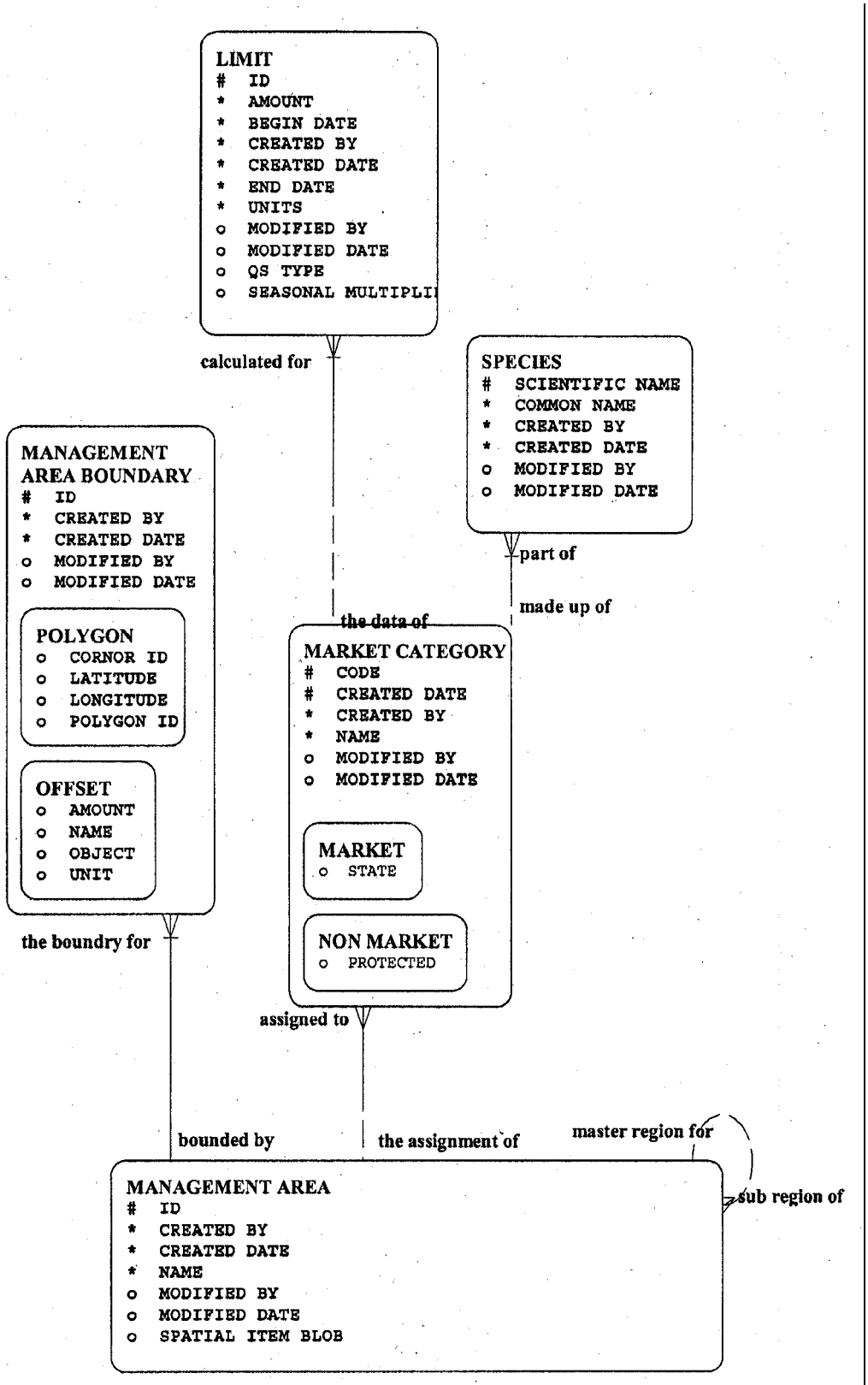


Figure 10. Master Entity Relationship Diagram.

4.1.1.9(g) Management Area Boundary History—This entity contains historical information about the boundary information for a management area.

- **Polygon History—**This entity contains historical information about the latitude and longitude points (at least 3) that defined the polygon for a management area.
- **Offset History—**This entity contains historical information about the offset applied to a region of coastline that defined a management area.

4.1.1.9(h) Participant Role History—This entity contains historical information about the roles that a person has held. These roles currently are skipper, crew, owner, observer, and other.

4.1.1.9(i) Port History—This entity contains historical information about the home port of vessels, where trips begin and where end or fish are landed.

4.1.1.9(j) Role History—This entity contains historical information about the roles that a participant could hold. These roles currently are skipper, crew, owner, observer, and other.

*Note: The following tables will have history tracked using views and therefore do not have journal tables called out as separate tables:

- Vessel.
- Trip.
- Participant.
- Landing.
- Landing Detail.
- Fishing Activity.
- Catch.
- Permit License.
- Quota Share.
- Category.
- Protected Species Incidental Take.

4.1.1.10 Economic Information

This group contains the entities that detail limited economic factors relating to fishing and to operating a vessel.

4.1.1.10(a) Consumable Type—This entity will contain data related to the consumable types used during a trip. The fisher will enter this data, will be able to pick from a pre-configured initial list, and will also be able to customize consumable types.

4.1.1.10(b) Consumable Item—This entity will contain data related to the consumable items used during a trip. The fisher will enter this data, will be able to pick from a pre-configured initial list and will be able to create his own consumable item. These will be combined with the original list, for use in subsequent selections.

4.1.1.10(c) Ancillary Equipment—This entity will contain the data related to additional equipment needed to catch, retain, and/or process fish.

4.1.1.10(d) Process Equipment—This entity will contain the data related to the equipment needed, if any, to process fish onboard a vessel.

4.1.1.10(e) Propulsion System—This entity will contain the data related to the propulsion systems onboard a vessel.

4.1.1.10(f) Structure Modification—This entity will contain the data related to the structural modifications made to a vessel.

FIGURE 11: Economic ERD
Figure 11 identifies the tables that will be tracked to manage data about economic information relating to vessels and trips.

4.1.1.11 System Information

This group contains the entities that are used by the system to assist with its operation.

4.1.1.11(a) Configuration—This entity contains information about the system configuration. It is used to configure the system with regional specific information.

4.1.1.11(b) Synchronize—This entity contains information about the last time the onboard application synchronized the master data with the central database.

4.1.1.11(c) Transaction—This entity contains information about a transaction. This data is the first record in a transaction and will be retained for verification.

4.1.2 Spatially Enabled Tables

A spatially enabled table contains the reference information needed to graphically represent the appropriated information in a GIS. This information references the items spatial data. Spatial data represents the shape, location, or appearance of geographic objects in the table.

There are four tables that will be spatially enabled in the system (Trip, Fishing Activity, Management Area, and Management Area History). Each marker location will become an object in the Trip table. All the points along a fishing activity will become one of its objects. The boundaries for a management area become objects in management area and management area history when a change is made.

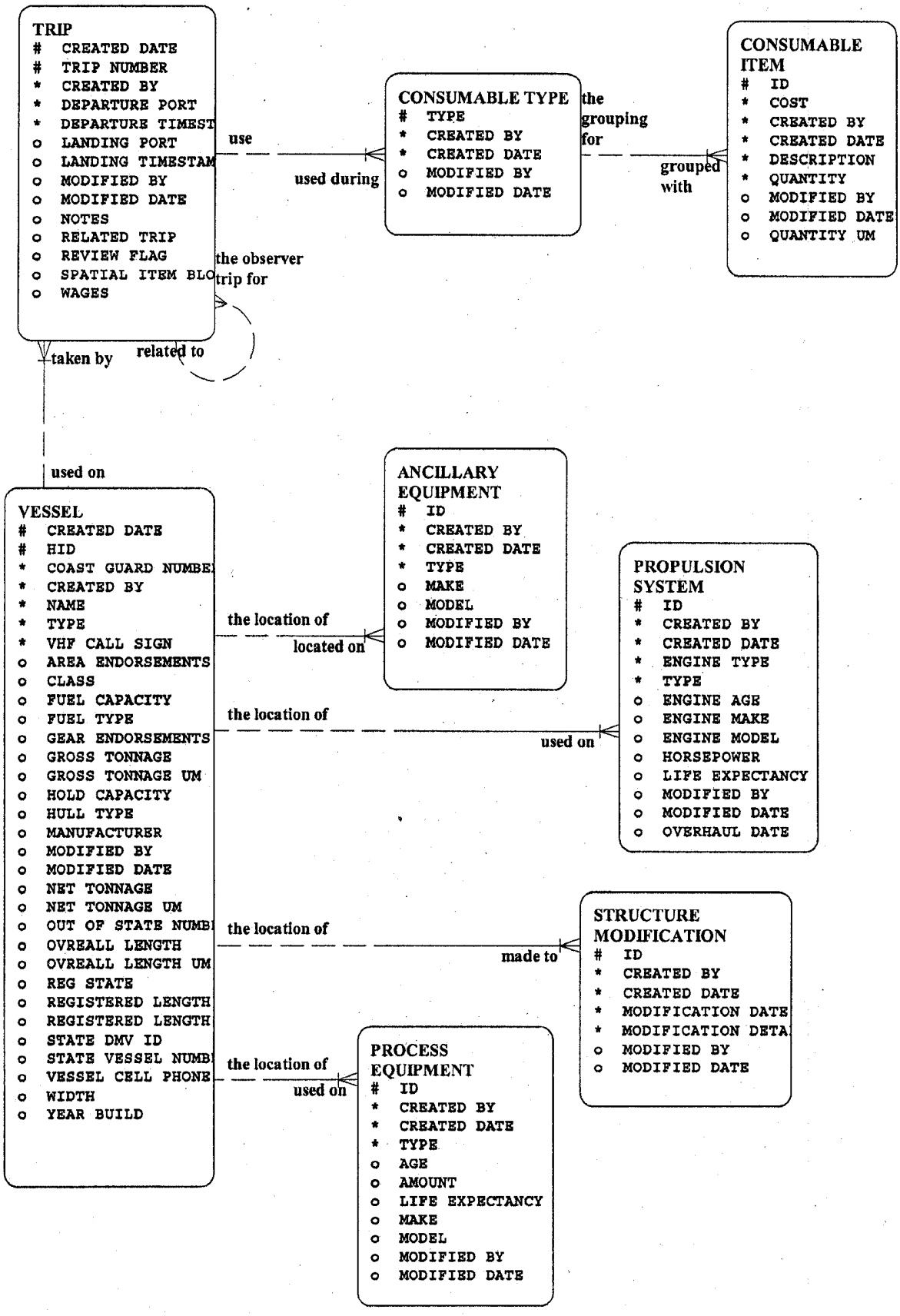


Figure 11. Economic Entity Relationship Diagram.

4.2 Transaction Specifications

Because both the onboard application and the central data system will use a similar data model and the onboard application caches information until it is convenient/appropriate for transfer, it is necessary to construct a set of standard transactions to communicate between the two systems.

These transactions will be made up of fixed format records. Each record is intended to encapsulate information about a specific set of actions or processes that have occurred. Transactions will be secured and signed with appropriate keys and then will be transmitted as if they are an S/MIME message. On receipt, the central data system will open and process the information into the system. If problems are found (e.g., incomplete or garbled information), or conflicts are identified, an error message will be sent back out to the vessel. While interim or incomplete reports will be allowed, when the trip summary transaction is received, the system will validate the completeness of all reports.

Transactions are broken into descriptions of actions so that each transfer can represent an autonomous report. The following diagram helps to illustrate how the sequence of transactions will create a dialog between the onboard application and the central data system to allow the complete transfer of data.

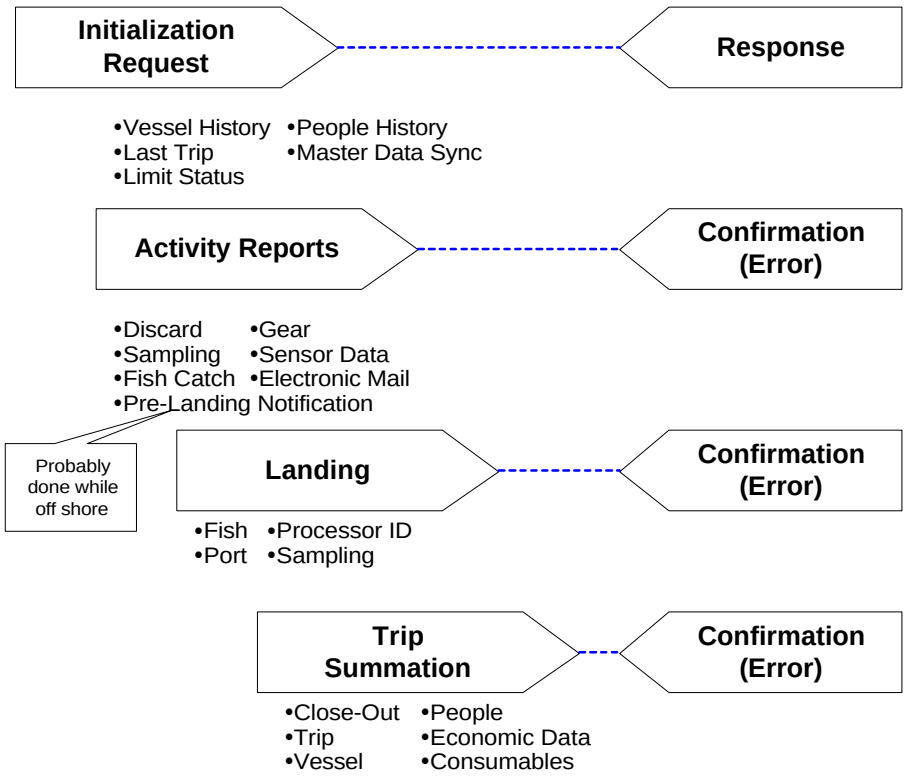


Figure 12. Transaction Dialog.

Because current satellite communication costs can be as much as a penny a character, the definition of transactions was driven by the use of Internet EDI standards and the need to make

the transactions as small as possible. Because there are no formal EDI standards for this type of information, each transaction is defined in Appendix C.

Once transactions have been collected to describe the trip, users will access the central data system through the web application. This system will allow appropriate users to update information, and will provide reports to applicable site visitors (see the section 4.3 description of the system security architecture for further details).

4.2.1 Summary of Transactions

The following are a set of summary tables listing each transaction by number. It shows the transaction number, transaction name, the maximum byte count for the transaction, whether it is mandatory, optional or a response, if the transaction is likely to be used offshore (at sea), and the corresponding response or request transaction number.

The following table provides a summary of the transactions that the onboard application will handle.

Trans #	Transaction Name	Max Byte Count	Mandatory / Optional	Likely Offshore Transaction	Response Transaction
	Shipboard to Central Database Transactions				
1	Ship Request Transaction	34	Mandatory		21
2	Trip Request Transaction	49	Mandatory		22
3	Crew Request Transaction	85	Optional	Offshore	23
4	Limit Request Transaction	79	Mandatory	Offshore	24
5	New Trip/Master Data Request Transaction	43	Mandatory	Offshore	25
6	Trip Crew Transaction	328	Skipper/Mandatory	Offshore	32
7	Consumable Transaction	109	Optional	Offshore	32
8	Trip Close Transaction	405	Mandatory	Offshore	32
9	Fishing Activity Location Transaction	83	Mandatory		32
10	Fish Act Transaction	154	Mandatory	Offshore	32
11	Catch Transaction	82	Mandatory	Offshore	32
12	Marker Transaction	72	Optional		32
13	Enviro Sensor Transaction	91	Optional	Offshore	32
14	Gear Values Transaction	76	Mandatory	Offshore	32
15	Biological Transaction	292	Optional		32
16	Protected Species Take Transaction	137	Optional		32
17	Protected Species Sighting Transaction	111	Optional		32
18	Gear Alias Transaction	92	Optional		32
19	E-Mail Transaction	243	Optional		

The following table provides a summary of the transactions that the CDC will handle.

Trans #	Transaction Name	Max Byte Count	Mandatory / Optional	Likely Offshore Transaction	Response Transaction
	Central to Shipboard Database Transactions				
20	Ship Response Transaction	419	Response		1
21	Trip Response Transaction	1199	Response		2
22	Crew Response Transaction	340	Response		3
23	Limit Response Transaction	76	Response		4
24	New Trip Response Transaction	69	Response		5
25	Mgt Area Sync Response Transaction	322	Response		5
26	Category Sync Response Transaction	184	Response		5
27	Species Sync Response Transaction	145	Response		5
28	Protected Species Char Sync Response Transaction	173	Response		5
29	Role Sync Response Transaction	77	Response		5
30	Port Sync Response Transaction	167	Response		5
31	Gear Cat Sync Response Transaction	179	Response		5
32	Receipt Response Transaction	56	Response		6-18,34-39
19	E-Mail Response Transaction	243	Optional		

The following transactions are optional or reserved for later use, and will predominantly be used while the vessel is in port, therefore they represent a potential “Shore-to-Shore” transaction.

Trans #	Transaction Name	Max Byte Count	Mandatory / Optional	Likely offshore Transaction	Response Transaction
	Shore to Shore Database Transactions				
33	Landing Transaction	85	Rsv’d for Later Use		32
34	Landing Detail Transaction	74	Rsv’d for Later Use		32
35	Ancillary Transaction	128	Optional		32
36	Process Equip Transaction	128	Optional		32
37	Propulsion Transaction	112	Optional		32
38	Structure Mod Transaction	259	Optional		32

Listed below is a summary of all the anticipated transactions that will be utilized by the systems, both onboard and shore side. In Appendix C is a listing of the general standards that will apply to all transactions: a detailed listing to each transaction; its usage; the data definitions; validation and authorization parameters; computation parameters; and the activity processing for each transaction.

4.2.2 Shipboard to Central Transactions

Depending on the type of communication, most of these transactions could be executed while at sea. Some will be completed while onshore, as they will require significant time to complete and would be less expensive if completed onshore.

4.2.2.1 Initialization Request Transactions

4.2.2.1(a) Ship Info

Transaction Name: Ship Request Transaction
Usage: Request vessel information for initializing shipboard application for a new fishing trip (by vessel ID).

4.2.2.1(b) Trip Info

Transaction Name: Trip Request Transaction
Usage: Request trip initialization information and update of legally required data.

4.2.2.1(c) Personnel Info

Transaction Name: Crew Request Transaction
Usage: Request crew member information for initialization of shipboard application for a new fishing trip (by vessel, skipper, or crew member name).

4.2.2.1(d) Limit Status

Transaction Name: Limit Request Transaction
Usage: Request the current permits limit/quota share amounts for the vessel and/or crew members.

4.2.2.1(e) Start New Trip

Transaction Name: New Trip Request Transaction
Usage: Request the data initialization of a new trip. Also compare the synchronization date onboard with the dates of the master data tables. Identify the number of records available for update and allow the user to select the update.

4.2.2.2 Trip Transactions

4.2.2.2(a) Crew ID - for each

Transaction Name: Trip Crew Transaction
Usage: Used by an authorized crew member to update the central database with information about the crew for a specific trip.

4.2.2.2(b) Consumables

Transaction Name: Consumable Transaction
Usage: Used by an authorized crew member to update the central database with information about the consumables used during a specific trip.

4.2.2.2(c) Close Trip

Transaction Name: Trip Close Transaction
Usage: Used by an authorized crew member to update the central database with the final trip information.

4.2.2.2(d) Fishing Activity Location

Transaction Name: Fishing Activity Location Transaction

Usage: Used by an authorized crew member to update the GPS-related track points for a fishing activity.

4.2.2.2.(e) Fishing Activity Record (trawl, cast, pot drop**)**

Transaction Name: Fish Act Transaction

Usage: Used by an authorized crew member to load fishing activity information into the central database.

4.2.2.2(f) Catch Record

Transaction Name: Catch Transaction

Usage: Used by an authorized crew member to load catch and discard information into the central database. This information is currently recorded in the paper logbook.

4.2.2.2(g) Marker Record - one for each marker

Transaction Name: Marker Transaction

Usage: Used by an authorized crew member to update the central database with GPS tracking data related to fishing activity markers.

4.2.2.2(h) Environmental Sensor Samples

Transaction Name: Enviro-Sensor Transaction

Usage: Used by an authorized user to update the central database with the data related to the sensors onboard the vessel.

4.2.2.2(i) Gear Values

Transaction Name: Gear Values Transaction

Usage: Used by an authorized crew member to update the central database with the value(s) for the characteristics.

4.2.2.2(j) Gear Aliases

Transaction Name: Gear Values Transaction

Usage: Used by an authorized crew member to update the central database with gear aliases.

4.2.2.3 Sampling Transactions

4.2.2.3(a) Biological Report

Transaction Name: Biological Transaction

Usage: Used by an authorized user to transfer biological sample information to the central database.

4.2.2.4 Protected Species Transactions

4.2.2.4(a) Protected Species Incidental Take Report

Transaction Name: Protected Species Take Transaction
Usage: Used by an authorized user to transfer incidental take information to the central database.

4.2.2.4(b) Protected Species Sighting Report

Transaction Name: Protected Species Sighting Transaction
Usage: Used by an authorized user to transfer protected species sighting information to the central database.

4.2.2.5 Miscellaneous Transactions

4.2.2.5(a) E-Mail

Transaction Name: E-Mail Transaction
Usage: Used by an authorized user to send e-mail.

4.2.3 Central to Shipboard Transactions

In most cases each transaction request must authenticate the user. Authentication routines must verify that the user is permitted to obtain the requested data. For example, a Ship Request Transaction will first have to authenticate that the user was either the Skipper of the vessel or an authorized crew member. Anyone else will receive an error message.

4.2.3.1 Initialization Response Transactions[4]

4.2.3.1(a) Ship record response (by ship ID)

Transaction Name: Ship Response Transaction
Usage: Used in response to a request for vessel information. The user will be validated and authenticated to insure that they can retrieve the requested vessel information.

4.2.3.1(b) Request Trip Info

Transaction Name: Trip Response Transaction
Usage: Used to establish that the legally required data is available onboard. It will load the required number of days of logbook information.

4.2.3.1(c) Request all by ship, Skipper, or name

Transaction Name: Crew Response Transaction
Usage: Used in response to a request for crew member information. The user will be

[4] On receipt of a request the system will only respond if the requestor is authorized for access to the requested data.

validated and authenticated to insure that they can retrieve the requested crew member information.

4.2.3.1(d) Request limits for all permits held by Skipper

Transaction Name: Limit Response Transaction

Usage: Used in response to a request for limit/quota share information. The user will be validated and authenticated to insure that they can retrieve the requested limit information.

4.2.3.1(e) New Trip Response

Transaction Name: New Trip Response Transaction

Usage: Used to indicate to the shipboard database/application that the data sent was received and processed and to begin the master data synchronization.

4.2.3.2 Master Data Sync Responses

4.2.3.2(a) Management Area Record

Transaction Name: Mgt Area Sync Response Transaction

Usage: Used in response to a request to synchronize the management area table in the central database with the management area table in the shipboard application. This transaction will send the management area records that have been updated to the vessel.

4.2.3.2(b) Category Record

Transaction Name: Category Sync Response Transaction

Usage: Used in response to a request to synchronize the category table in the central database with the category table in the shipboard application. This transaction will send the category records that have been updated to the vessel.

4.2.3.2(c) Species Record

Transaction Name: Species Sync Response Transaction

Usage: Used in response to a request to synchronize the species table in the central database with the species table in the shipboard application. This transaction will send the species records that have been updated to the vessel.

4.2.3.2(d) Protected Species Characteristic Record

Transaction Name: Protected Species Char Sync Response Transaction

Usage: Used in response to a request to synchronize the protected species characteristics table in the central database with the protected species characteristics table in the shipboard application. This transaction will send the protected species characteristics records that have been updated to the vessel.

4.2.3.2(e) Role Record

Transaction Name: Role Sync Response Transaction

Usage: Used in response to a request to synchronize the role table in the central database with the role table in the shipboard application. This transaction will send the role records that have been updated to the vessel.

4.2.3.2(f) Port Record

Transaction Name: Port Sync Response Transaction
Usage: Used in response to a request to synchronize the port table in the central database with the port table in the shipboard application. This transaction will send the port records that have been updated to the vessel.

4.2.3.2(g) Gear Category Record

Transaction Name: Gear Cat Sync Response Transaction
Usage: Used in response to a request to synchronize the gear category table in the central database with the gear category table in the shipboard application. This transaction will send the gear category records that have been updated to the vessel.

4.2.3.3 Confirmation Transactions

4.2.3.3(a) Receipt Response

Transaction Name: Receipt Response Transaction
Usage: Used to indicate to the shipboard database/application that the data sent was received and processed.

4.2.3.4 Miscellaneous Transactions

4.2.3.4(a) E-Mail

Transaction Name: E-Mail Transaction
Usage: Used by an authorized user to receive e-mail.

4.2.4 Shore to Shore Transactions

The current design uses a direct connection to the database. All of these transactions are called out for future use.

4.2.4.1 Landing Transactions

4.2.4.1(a) Landing Info

Transaction Name: Landing Transaction
Usage: Used by an authorized user to update the central database with the data related to the landing.

4.2.4.1(b) Landing Details

Transaction Name: Landing Detail Transaction
Usage: Used by an authorized user to update the central database with the details for the landing.

4.2.4.2 Economic Transactions (optional)

4.2.4.2(a) Ancillary Equip Report

Transaction Name: Ancillary Transaction

Usage: Used by an authorized user to report changes to the ancillary equipment installed on a vessel.

4.2.4.2(b) Process Equip Report

Transaction Name: Process Equip Transaction

Usage: Used by an authorized user to report changes to the fish processing equipment installed on a vessel.

4.2.4.2(c) Propulsion Type Report

Transaction Name: Propulsion Transaction

Usage: Used by an authorized user to report changes to the propulsion systems installed on a vessel.

4.2.4.2(d) Structure Mod Report

Transaction Name: Structure Mod Transaction

Usage: Used by an authorized user to report structural modifications made to a vessel and what port they were made in.

4.3 Security Specification

Authentication throughout the system will be handled by the use of public key certificates that will enable implementation of a Public Key Infrastructure (PKI). Because each of these subsystems uses different technologies, security is defined for three subsystems: the onboard application, the CDC, and the web application.

A PKI makes use of a set of asynchronous keys to secure and sign data. Each entity is granted a public key and a private key. The asynchronous nature of the keys ensures that what the public key secures, only the private key can open, and vice versa. Consider the following;

- A message sent from the boat is signed with the private key of the Skipper to mark it as authentic from him. The message is then secured with the public key of the central server. These activities seal the message and encrypt it for safe transmission.
- On receipt, at the central server, the private key for the central server is used to open the first seal on the message and then the public key for the Skipper is used to open the second seal and decrypt the message.

This process ensures that it is possible to authenticate the source of a message and ensure that only the user the message is addressed to can interpret the message.

The PKI for this system will be used to authenticate users seeking access to the system. Web browsers will need to have the appropriate private key certificate registered with their browser to allow them to gain access to the system. In addition, access to the onboard system will be controlled by providing the system with the user's certificate (either via floppy disk or smart card) and a PIN to authenticate their access.

Once a user has been granted access to the system, the data and system functions to which they are permitted access will be controlled by the access role with which they are identified. For the two subsystems that have a user interface (the onboard and web applications), the system uses a set of defined roles.

The following sections provide further explanation of these roles.

4.3.1 Definition of Usage Roles

Some roles are only applicable to certain subsystems while others function in all subsystems. This section will define those roles, how they are implemented within a subsystem, and the mechanics of using them.

This table shows the roles and the subsystems in which they will be implemented. Note that a user may be granted more than one access role.

Sub System / Role	Onboard	Web
Fisher	X	X
Observer	X	X
Biologist		X
Processor		X
Enforcement	X	

4.3.2 Roles and Use

4.3.2.1 Onboard Application

Since the fisher and an observer could share the onboard application it will be their responsibility to logout of the application to insure data security.

4.3.2.1(a) Fisher

Within the onboard application, this role can create, update, delete, and view all non-master data related to trips, participants, vessels, fishing activities, and protected species. All fishing activity related data must be transmitted to the central database before the trip can be closed out. In general, reporting will be done by the skipper, although the skipper may authorize crew to use their identity.

4.3.2.1(b) Observer

Within the onboard application, this role can create, update, delete, and view all nonmaster data related to trips, participants, vessels, fishing activities, protected species, and sampled biological and specimen data created by it. When observers may have their own system the application would be loaded on it. The application will provide for an observer's trip to be associated with a

4.3.2.1(c) Enforcement

Within the onboard application, this role can view all trip information relating to the required logbook information for current and past trips, including information related to the vessel, crew, and permits.

4.3.2.2 Web Application

The web application is divided into three sections. Users are granted access to one or more sections of the site based on the roles they represent. They will have access only to data that they have responsibility for.

4.3.2.2(a) Fishers

This role can view all data related to the vessel, participant, system configuration, and master data. Fishers that access the website will be one of the following two types of users.

Owner

This user has no access to the biological sample or specimen information. If the skipper grants access the user can view all the trip-related data for fishing trips operated from their vessel.

Skipper

This user can create, update or delete all of the trip-related data that hasn't been transmitted to the central database. Once it has been transmitted the skipper can't delete it. The user can view the landing, sample, and specimen information.

4.3.2.2(b) Observer

Observers will gain access to the website in the same way as a fisher. This role can create, update or delete all of their trip-related data that hasn't been transmitted to the central database. Once it has been transmitted the observer can't delete it. The user can view the landing, sample, specimen, and vessel information.

4.3.2.2(c) Biologists

Researchers and resource managers that access the website fall into the following categories of users.

Official Port Biologist
This user can create, update or delete all data related to Samples and Specimens. It has the responsibility for reviewing the fish tickets and logbooks. As such it can update the catch and landing information. It can view Vessel and Trip information and create all necessary hardcopy reports.

Resource Manager
This user can create, update and delete data related to the management area, their boundaries and the associated limits. It can view all necessary system configuration information. It can execute all necessary reports.

Researcher
This user will only be used through the web and can view all data related to fishing. In general this class of user will access the system at the database level. Their access will be authenticated, but they will perform all data retrieval using separate tools.

4.3.2.2(d) Processor

This role will be used through the web. It will create, update and delete data related to the landing of a catch. It will be able to view some of the vessel, trip, and catch information as well. It can produce any required reports.

4.3.2.3 Database

4.3.2.3(a) Data Administrator

Data Manager
This role has total access to all data stored on the central database. The database manager will use this role to perform all required database activities. This role will be used to create, update, or delete all the system configuration information.

4.3.3 Security Implementation

Each subsystem is required to fulfill a set of specific security needs. The following section details security needs and the mechanisms used to support the needs.

4.3.3.1 Onboard Subsystem Security Needs

4.3.3.1(a) Restrict use to authorized users

The system will maintain a cache of public keys for authorized users.

To gain access, the user will provide their private key either by directing the system to a disk (floppy) location where the certificate has been stored or by a smart card that contains the certificate information.

Once the system has validated that the private and public keys are a match, the user will be required to provide a PIN to validate the request for authentication. This PIN will be hashed to match the certificate.

4.3.3.1(b) Enforce access rules

The certificate will contain a value for the role(s) that the user is authorized to use in the organization value for the certificate. This value will be used by the system to grant access to the appropriate system functions.

4.3.3.1(c) Secure data entered into the system

The system will keep an audit trail for all changes (including insert, update, and/or delete actions) made to data. This history will identify the change and the identity of the user who made the change.

The system will log successful and unsuccessful attempts to access the system.

The data store for the system will be secured in an encrypted and/or password protected form to ensure that data is not tampered with outside of the application.

While the system can provide users access to their data outside of the application (e.g., users can request that an unencrypted set of transaction be dumped to disk), this data will be marked as exported and may not be imported back into the system. This will ensure that it has not been tampered.

4.3.3.2 Web Subsystem Security Needs

4.3.3.2(a) Restrict use to only authorized users

The system will require users to register their authorization certificate with the browser they are using to access the system. On entry to the site, the user will be asked to provide their PIN. Use of these devices will secure the site to only authenticated access.

4.3.3.2(b) Enforce access rules

The certificate will contain a value for the role(s) that the user is authorized to use in the organization value for the certificate. This value will be used by the system to grant access to the appropriate system functions.

4.3.3.2(c) Secure data entered into the system

The system will keep an audit trail for all changes (including insert, update, and/or delete actions) made to data via the web application. This history will identify the change and the identity of the user who made the change.

Usage profiles will be enforced using database-enforced access profiles.

The system will log successful and unsuccessful attempts to access the system.

The central data system will be secured behind a firewall that will restrict access to authorized users and services.

4.3.3.1 Central Database Connection Subsystem Security Needs

4.3.3.3(a) Restrict use to authorized users

The central system will have a unique certificate set that identifies the central system. This key set will be obtained from an independent third party (e.g., Verisign).

On receipt of a transaction, the system will validate that it was secured with the public key for the central system.

The system will then use the public key for the originating reporter to authenticate the second seal on the transaction. Pending validation of both seals, the transaction will be decrypted and processed.

Transactions that are returned to the vessel will be secured and sealed with the central system token and the token for the destination user.

4.3.3.3(b) Secure data entered into the system

The system will keep an audit trail for all changes (including insert, update, and/or delete actions) made to data via the web application. This history will identify the change and the identity of the user who made the change.

Usage profiles will be enforced using database-enforced access profiles. Transactions will be validated to ensure that a user has not constructed a transaction they should not be able to perform.

The system will log successful and unsuccessful attempts to access the system.

The central data system will be secured behind a firewall that will restrict access to authorized users and services.

4.3.4 Submitting for an Account

To obtain authorized access to either the EFCL website, or to get an authorized access account to the onboard system, people must submit for an account to the central services. This submission can be made either in writing or via the "new account" portion of the website.

Each application will request general information about the user such as name, contact phone number and e-mail address.

To ensure that authentication credentials are sent to the appropriate people, the application will not request an address. Instead, the application will request key information that can be linked to known addresses and the credentials will be mailed to that address. The following rules will be used:

Group	Information to Provide	Address Mailed to
Fishers & Owners	Permit Number	Address on Permit
Researchers	Agency & Division user is Associated with	Agency Address
Enforcers	Agency & Division user is Associated with	Agency Address
Processors	License Number	Address on License

After validating the information on the application, an authorization/initialization package will be sent to the appropriate address.

The authorization/initialization package will contain the onboard application, initialization data for the onboard application, the private key certificate (used to authenticate access to the system), and system documentation.

4.4 Communication Protocol Specification

The overall communication system will have three components in it. This section details those components.

4.4.1 Onboard Application Communication

When the user of the onboard application is ready to send a transaction it will be accomplished in the following manner:

- The user selects the type of communication device they will be using for this transmission (e.g., modem, satellite, etc).
- The application then selects the transactions ready for sending and uses the public key certificate to secure/sign the transaction. The transaction will then be compressed using existing compression technology.
- The user will then initiate a connection with the selected device and identify the telecommunication site or Internet site with which to connect (i.e., dial their internet service provider [ISP]). The system will allow for multiple connection points to provide for the most cost-effective communication possible.

The user will have an option to output the transactions to a text file. The output will be either 1) encrypted transactions that will be "couriered" to the central system at a later date or 2) unencrypted data. If 2) is chosen the user will be entirely responsible for maintaining the security of this data. There will be no option to allow for this data to be loaded back into the onboard application or to the central system.

4.4.2 Central System Communication

Upon receipt of the transaction/message, the SMTP service will receive the S/MIME message. On a routine basis a server-based process will attempt to interpret each S/MIME message. Interpretation will entail use of the server's private key and use of the public keys available from the local Certificate Authority to decrypt the message. Based on successful authentication and decryption of the certificate, the values within the certificate will be used to assist the transaction handler process the message.

Outbound EDI transactions will be constructed using the Mail API encrypted with the appropriate certificate and sent by SMTP service. The SMTP message header for the transaction will identify the vessel that is the destination of the message.

Each time the onboard application connects to the central system to send messages it will check to see if any pending transactions are waiting to be received. If there are, it will receive each S/MIME message using the workstation SMTP service. It will utilize its private key and the library of public keys in its datastore to decrypt the message. It will then utilize the transaction handler to process the transaction.

4.4.3 Web System Communication

The web portion of the system will be accessed through standard Internet Browsers (Netscape or Internet Explorer 4.x or higher). To ensure use by the widest audience the prototype will be validated using both of these browsers.

A browser will access a website via HTTP protocol. Certificates registered to the browser, and issued by the EFCL systems certificate authority that run in conjunction with the web server, will

handle authentication by the web. Certificates will validate the user and identify the roles that are accessible by the user. This information will be used in granting access to the different sections of the web application.

4.5 GIS Specification

The intent of this section is to provide information about how the EFCL will handle and manage spatial information. This section will address each sub-system, and identify how it will manage components of spatial data. The system will address: interfaces to exchange boundary and position information with the onboard application; the receipt of data into the central Oracle database; integration of the information with an ESRI GIS system; and, the constructs necessary to enable access to the data through the web application.

The specification assumes the use of NWFSC GIS software: namely, ESRI Arc/Info and acquisition of SDE extensions to that software.

4.5.1 Spatial Data Management for the Onboard Application

The primary component used for managing spatial data in the onboard subsystem is the charting module. This module is a commercial application that will accept inputs and then represent these in a graphical format. The base layers for this graphical representation are navigation charts for the area that the vessel is in. The system will also receive input from a GPS system and will represent the vessel's past and current position information on the navigational chart. The onboard application will allow the user to identify activities (such as start and stop of trawls) along this path.

The charting module will receive GPS data through a serial interface managed by the device interface component. Position data will be cached in the GPS device, and based on a defined polling frequency, will be stored in the onboard data store. GPS data will include latitude/longitude and time stamps.

The application will also allow the identification of markers on the chart. Markers are points that a skipper or observer may choose to call out to identify specific hazards or features at a specific location. The skipper or observer in the charting application will identify markers. The charting application will store a location (in latitude/longitude) and a notation for each marker.

4.5.2 Receipt at the Central Database Connection

The primary GIS function performed by the central database is to convert the GPS coordinates and associated data collected on the vessel into "spatial data," or features that appear on a map. The data collected includes the following:

- Fishing activities – GPS coordinates are collected and identify where the vessel started and stopped fishing activities and along the fishing track.
- Markers – hazards, events, or other items of interest to the vessel's skipper or observer.
- Protected Species Sightings – GPS coordinates are collected to identify the location where a protected species was encountered.

The spatial data is managed using the ESRI SDE product. SDE is an extension to a relational database management system (RDBMS). SDE extends the RDBMS's functionality by making it possible to store mapped information in the RDBMS rather than in a separate GIS database. The advantages to this are:

- All data (spatial and tabular) are stored in a single database.
- All transactions are managed by the RDBMS.
- Uses existing RDBMS security, backup, and recovery procedures.
- Allows simultaneous multi-user access.

SDE "spatially enables" a standard business table, to make it a data source to both standard RDBMS applications and mapping or charting applications. Four central database tables will be spatially enabled:

- TRIP – Markers established during a single fishing trip.
- FISHING ACTIVITY – Fishing activities.
- MANAGEMENT AREAS – An identification of geographic areas for management purposes.
- MANAGEMENT AREA HISTORIES – The historical record of how management areas have been defined.

SDE adds a new column to a spatially enabled table. This column is a foreign key to two additional tables hidden from the user. The feature table—F table—contains the actual spatial features. The spatial index table—S Table—is a two-dimensional index to the features in the F table. These three tables, the business, F and S tables, form what is called an "SDE layer," a source of spatial data for mapping and charting applications.

4.5.3 Turning GPS data into Spatial Features

Spatial features will be created when there is a completed transaction that loads data into the location table associated with a spatially enabled table. These associated tables are the Fishing Activity table, Fishing Activity Location table, the Trip table, and the Marker Location table.

4.5.3.1 Process General Outline

The trigger for the conversion is an update from the fishing vessel to the Trip, Marker Location and Protected Species Sighting tables and/or the Fishing Activity and Fishing Activity Location tables. When triggered, the central database will collect the data from the appropriate tables and submit it to the Shape Generator. The Shape Generator is a component in Arc/Info that is

responsible for creating the appropriate spatial features from the GPS coordinates, and loading them into the appropriate spatially enabled tables in the Oracle data system.

4.5.3.2 Shape Generator

Two possible approaches for creating the required spatial objects include:

- A GIS Server (Arc/Info running server mode) waiting for requests from the central database. Communications between the GIS Server and the central database are made using Open Network Consortium (ONC) remote procedure calls (RPC).
- A ShapeFile generator created using MapObjects and the SDE C API running on the same machine as the central database. The central database can then pass the required information to the ShapeFile generator to handle the subsequent steps.

Because the latter method will produce shape files that are useful for publication accessible via a browser and within the commercial onboard application, this approach is addressed in detail within this specification.

The Shape Generator is a small application created using ESRI's MapObjects OCX and the SDE C API. MapObjects contains methods for converting XY coordinates into spatial features. The SDE C API contains methods for managing an SDE installation, specifically loading and updating data. The following information will be passed to the Shape Generator:

- Feature ID – unique ID assigned to the spatial feature. The Feature ID should be the index key to the spatially enabled table.
- Destination Table – The name of the spatially enabled table into which the feature will be put.
- Spatial Feature Type – Key word, either POINT, LINE, or POLYGON. The spatial feature type determines how the coordinate information will be processed.
- Coordinate List – a list of XY coordinate pairs (a single pair for a point, many pairs for a line, many pairs for a polygon, the first and last coordinate pairs being the same).

Note that as information is fed to the shape generator, it is assumed that all spatial data has been normalized to the same coordinate system.

4.5.3.3 Process Specifics

The table on which the update/load events are triggered determines the process steps followed. Processing will occur only when the appropriate data is available.

4.5.3.3(a) Trip, Marker Location, and Protected Species Sighting tables:

Five potential situations exists:

- Update to the Trip table only. No spatial features are created in this case.
- Updates to the Trip and Marker Location tables – Spatial features are created. The central

database will determine if a minimum of one point is recorded in the Marker Location table. If at least one point is recorded the Central Database calls the Shape Generator with the following parameters: Feature ID is the Trip's ID from the Trip table; Destination table will be the Trip table; spatial feature type will be 'POINT'; and the coordinates will be a list of GPS coordinates sorted by their time stamp taken from the Marker Location table.

- Update to the Marker Location table – same as above case.
- Updates to the Trip and Protected Species Sighting tables – Spatial features are created. The Central Database will determine if a minimum of one point is recorded in the Protected Species Sighting table. If there is, the Central Database calls the Shape Generator with the following parameters: Feature ID is the Trip's ID from the Trip table; destination table will be the Trip table; spatial feature type will be 'POINT'; and the coordinates will be a list of GPS coordinates sorted by their time stamp taken from the Protected Species Sighting table.
- Update to the Protected Species Sighting table – same as above case.

4.5.3.3(b) Fishing Activity and Fishing Activity Location Tables:

Updates to the Fishing Activity Table and Fishing Activity Location Table – Spatial features are created. The Central Database will determine if a minimum of two points are recorded in the Fishing Activity Location table. If there are, the Central Database calls to the Shape Generator with the following parameters: Feature ID is Activity Start from the Fishing Activity table; destination table will be the Trip table; spatial feature type will be 'LINE'; and the coordinates will be a list of GPS coordinates sorted by their time stamp taken from the Fishing Activity Location table.

4.5.4 Access to GIS Data

The GIS database is divided into two parts based upon access and security requirements. The first parts are the SDE Layers describe above. These layers are core to the GIS or mapping component of the EFCL. It is assumed that this is business-sensitive information requiring the access and security measures provided by the Central Database.

The second part is an Arc/Info and ShapeFile library. This is either an existing or augmented NWFSC GIS library managed external to the EFCL. These data provide the context for the SDE layers and are assumed to be non-sensitive information from public or private sources requiring no security measures. System or network administrators manage access.

It is expected that the source for this data will be navigational charting.

4.5.5 Presenting Spatial Data in the Web Application

Data that is in the central system will be accessible via the web application. People using the web application will be able to perform queries on activities. The system will then return information in both tabular form and in the form of maps that present the activities.
In-depth spatial analysis will be performed via use of GIS and GIS-enabled scenario management

tools, such as ESRI tool set or Facet. The web interface will provide access to some standard reports that allow the different groups of users to analyze their activities spatially.

Access to data will be dependent on permissions assigned to the user. Access limitations apply only to the SDE Layers within the EFCL; no access limitations are placed on the Arc/Info Coverage and ShapeFile libraries. Observers, skippers, and fishers will be given access to the data they collected. Researchers will be given access to all data. The available data are the SDE layers (protected species sightings, protected species incidental takes, fishing activity locations, markers, and management area boundaries) as well as coverages and ShapeFiles in the NWFSC GIS Library.

Two sources provide the information presented to the user. An Internet Map Server (IMS) provides mapped information. The central database of the EFCL provides tabular information. The two are connected in that the mapped information can be used to extract information from tables in the EFCL.

Maps are accessed using any available Java-compliant Internet browser (i.e., Microsoft Internet Explorer or Netscape Navigator). On the server side, mapped information is generated and delivered to the browser using the IMS. The IMS uses ESRI's MapObjects OCX and IMS to create and send maps. MapObjects, and the IMS, can access any ESRI data source, including SDE layers, Arc/Info coverages, or ShapeFiles. The IMS will be fully configurable, allowing the system administrator to determine what data sources are used, how those data sources are displayed, and what information is returned by any query. Maps are delivered to the user as GIF or JPG images.

The browser side of the IMS is implemented using Java. Users can pan, zoom, turn layers on/off, select layers to display, label features, generate hardcopy maps, and query external database (i.e., the EFCL). All communication between the browser and the IMS are handled using HTTP.

4.6 Onboard Application Subsystem

The following is a breakdown of the primary components of the onboard application. A commercial partner is providing this subsystem. The following material outlines the content they will provide. They will control the format and presentation of these functions.

4.6.1 Login

This is the first screen that the user sees. Users will be authenticated using public key certificates. When users access the application, they will be asked to provide authentication in the form of a certificate and the applicable PIN – these will act as the username and password.

4.6.2 Main Application

4.6.2.1 Vessel Information

Allows the fisher or observer to log information about the vessel. They can also view permit and crew information.

4.6.2.2 Fish Logs

This is the heart of the application. It allows a fisher or observer to enter logbook data electronically. It captures all data currently captured by paper and pen methods as well as additional information requested by researchers or fishers.

4.6.2.3 GPS

The EFCL ties into the vessel's GPS system. It will have the ability to zoom in or out, grab and drag the window about, and place markers.

4.6.2.4 Trip Information

The application contains all pertinent information about a particular trip. The supplies and fuel dialogs also help to gather this information.

4.6.2.5 Samples

It allows an observer or a fisher to enter data about samples they may take from a fish catch event.

4.6.3 Menus

The following are menus that are available throughout the application. The menu system is straightforward to avoid unnecessary complexity.

4.6.3.1 Log

Lets users choose options that would normally be associated with file management.

4.6.3.2 Edit/View

Edit contains the Gear Profile dialog, Start and End Tow options (as well as Progress of Tow), and a selectable weight measurement.

4.6.3.3 Reports

Reports contain listings of all available onboard reports. For the most part, these mimic what can be found on the website.

4.6.3.4 Help

Help contains application-specific help for the onboard application and a link to a species catalog.

4.6.4 Additional Functionality

The following items will be dealt with in the onboard application:

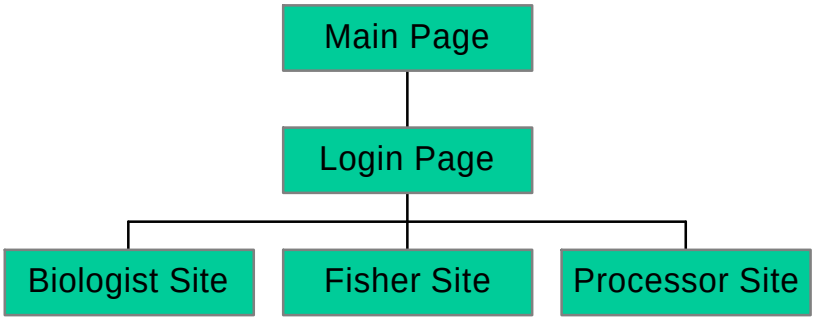
- Track transmission success and failures. When a failure receipt response is received the transaction will be re-sent when the next connection is established.
- When initializing the onboard application, data store, the application will only load the data relevant to the permits held by skipper and/or vessel (e.g., market categories, gear categories and characteristics, events, management areas, and boundaries).
- Provide the ability to enter trip information without first obtaining a new trip number from the central database.
- Track the changes to downloaded vessel and participant data for later transmission back to central database.

4.7 Web Application Subsystem

This section of the design provides an outline of the forms and reports addressed within the web application. This material identifies the structure for the website. The host site and the best industry practices will govern the content and presentation format.

Website mock-ups used during analysis may be accessed on the Northwest Fisheries Science Center website at http://www.nwfsc.noaa.gov/logbook/. These mock-ups demonstrate the proposed look and feel of the application as it was understood in July 1998. The mock-ups have not been updated to reflect current technical design and are not currently linked to any data system. Buttons, links, and menus that allow a user to move through the application have been constructed and dummy data has been inserted to illustrate how the system could function.

4.7.1 Web Application Design



4.7.1.1 Main Page

When users come to the EFCL site, they are first greeted with the Main Home page. This page will contain any banner information required by the site (i.e., general info, description of site, etc.).

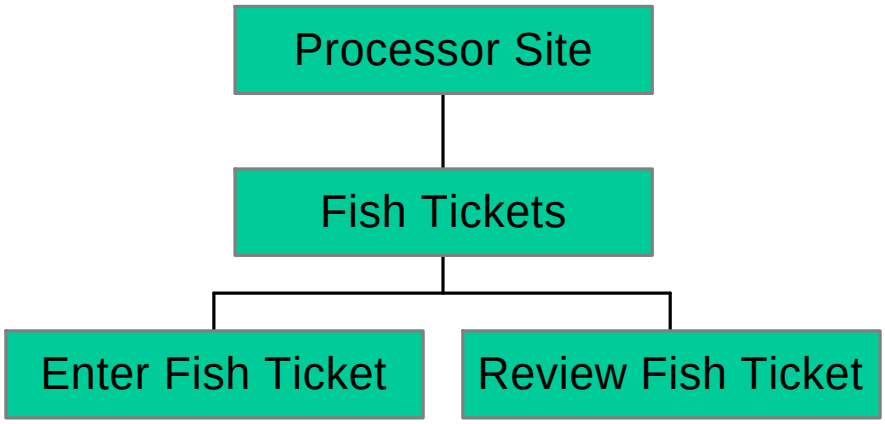
4.7.1.2 Login Page

This page provides for the authentication of various parties that may use the system. Authentication to the website will be managed via the same public key certificates that are used throughout the system. Users will register the certificate in their browser and then the site that authenticates access will use it.

4.7.1.3 Home Pages

These provide the entry point into each of the specific areas within the site. When users log onto the web, they will be directed to the home page that is appropriate for their role. The home page will provide access to site tools and information that is applicable to that group of users.

4.7.1.4 Processor Site



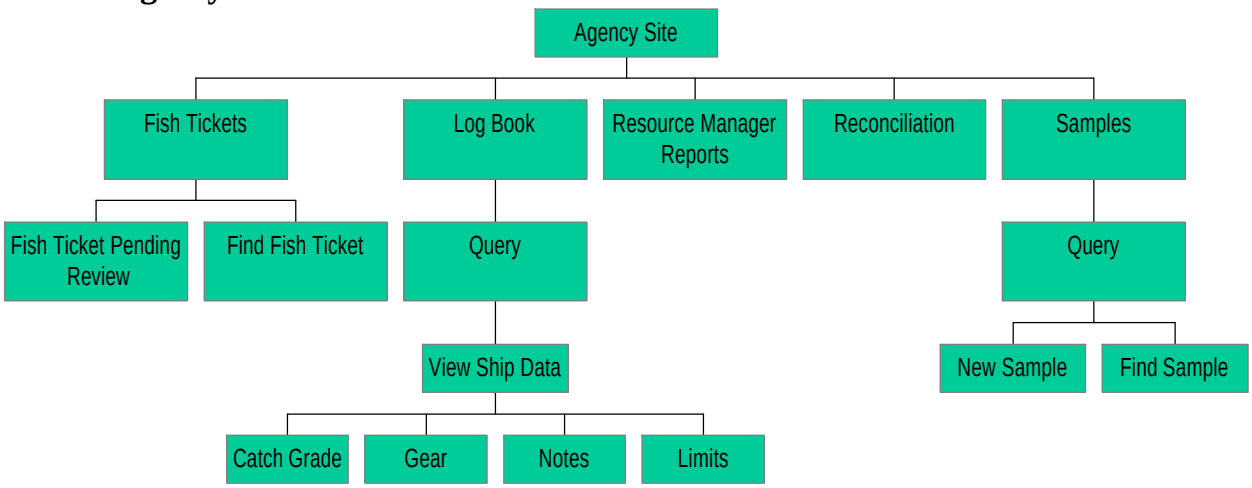
4.7.1.5 Fish Tickets

From here, a Processor can choose to either enter a Fish Ticket or Review an existing Fish Ticket.

4.7.1.5(a) Enter Fish Ticket—This is where a Processor can enter Fish Ticket information.

4.7.1.5(b) Review Fish Ticket—This is where a Processor can review and modify a fish ticket (but not after it has been submitted).

4.7.1.6 Agency Site



4.7.1.6(a) Fish Tickets—From here, the official port biologist can choose to either review a fish ticket, which has not yet been reviewed, or to find a particular fish ticket based on some search criteria.

- **Fish Ticket Pending Review**
  This is where the official port biologist can review all fish tickets that have not been reviewed.

- **Find Fish Ticket**

From here, the official port biologist can look for a specific fish ticket based on certain criteria. They can also correct the fish ticket.

4.7.1.6(b) Reports—This section will contain any reports that agency approved users require. See management reports section below.

4.7.1.6(c) Logbook—This is where the official port biologist can correct or add any missing data from an Electronic Logbook Onboard Application for a particular tow.

- **Query**
  An official port biologist can enter any criteria from a certain set to look for the particular Ship Data.

4.7.1.6(d) View Ship Data—When the above query returns data, it is displayed here. The official port biologist can then choose to update any information that needs to be changed. Several new screens can be accessed from this page.

- Catch
  Displays the retained catch weight (and possibly discard weight) by category caught on that tow.
- Gear
  Displays the gear category, its characteristics and the values that were used on that tow.
- Notes
  Displays miscellaneous notes logged by the skipper for that tow.
- Limits
  This "report" displays the weights of all market categories that were caught during the current fishing period and the limit for each category. Overages are calculated using the limit from the permit notification for the defined category.

4.7.1.6(e) Reconciliation—This section allows official port biologists to reconcile fisher logs with processor fish tickets. See section below.

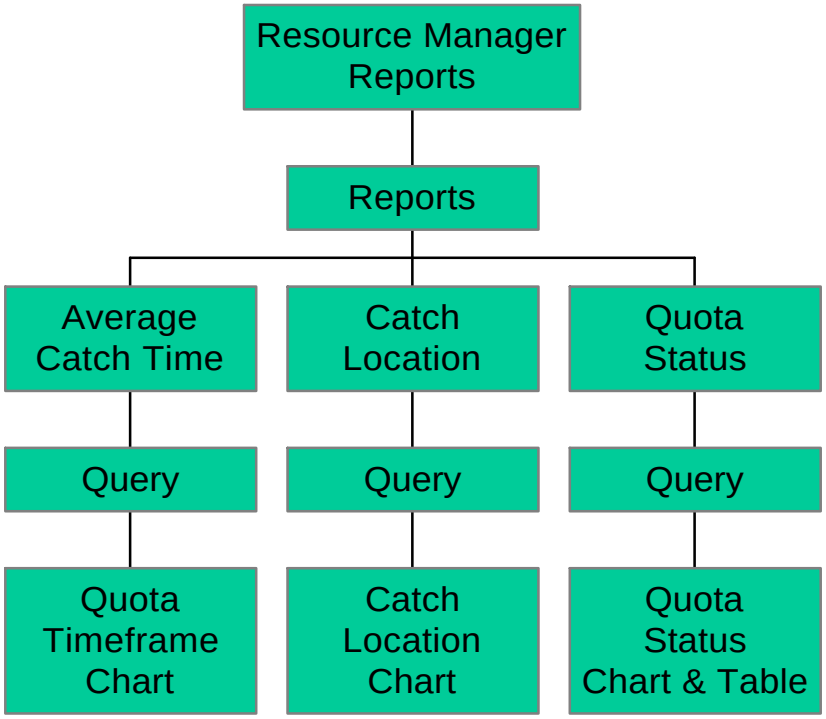
4.7.1.6(f) Samples—This section allows an official port biologist to enter sample data from Landings into the system.

- **Query**
  A Biologist can either enter a new sample, or find an existing one. If they choose to find an existing one, criteria such as date, landing or skipper can be entered to facilitate the search.

4.7.1.6(g) New Sample—An official port biologist can enter a new Sample from this page.

4.7.1.6(h) Find Sample—This page displays sample data that was previously entered. An official port biologist can choose to modify sample data from this page.

4.7.1.6.(i) Resource Manager Reports



These reports may be developed for one or more fisheries within a management area.

- Average Catch Time
  This is a report that displays, for example, the average fishing time for fishers to reach their limit for a given species.
  - Query
    Captures species criteria to base a report on.

- Quota Timeframe Chart
  A graphical display which charts, for example, the fastest, slowest, and average time for fishers to meet a quota for a certain species.

- Catch Location
  This report displays where fish where caught in a given region.
  - Query
    Captures species criteria as well as management area.

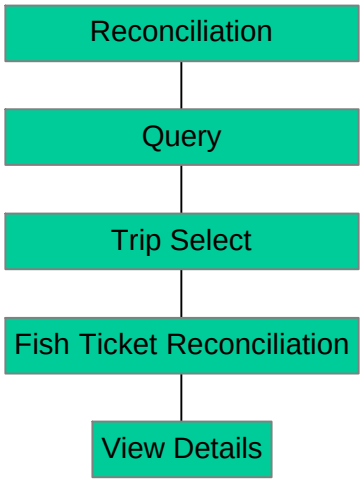
- Catch Location Chart
  Displays the region map with different colored dots representing different catches of different species.

- Quota Status
  Very similar to the quota status report for the official port biologist, except this one is graphical.

- Query
  Captures species criteria as well as management area.

- Quota Status Chart and Table
  Charts display (in percentage of limit) the catch for a species based on all fisher data. Also displays the amount of discarded fish by species.

4.7.1.6(j) Official Port Biologist Reconciliation

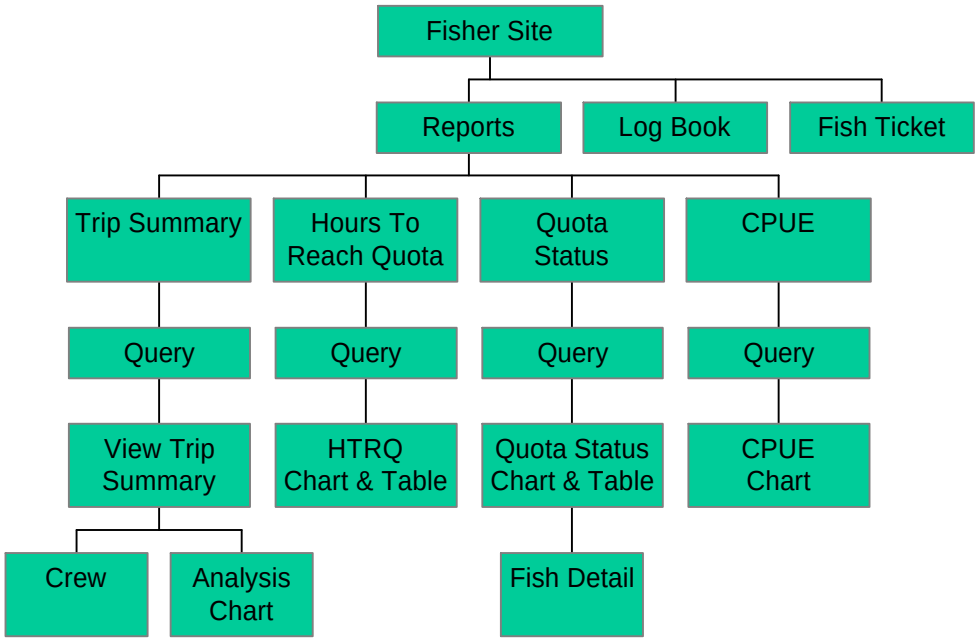


- Query
  This screen captures trip criteria to try and find data for a particular trip.
  - Trip Select
    This is a subsidiary screen to the query screen. If query information relates to more than one trip, the official port biologist can choose the appropriate trip.

- Fish Ticket Reconciliation
  Allows Official Port Biologists to view information from both the fish ticket and the Log at the same time. The official port biologist can click on 'View Details' to correct incorrect information.

- View Details
  Allows an official port biologist to view detail information on both the fish ticket and the logbook and to make corrections.

4.7.1.7 Fisher Site



4.7.1.7(a) Reports—The main area of interest for fishers is reports. From here, a fisher can access reports that relate their data captured in the EFCL system.

- Trip Summary
  This report details all information for a given trip.
  - Query
    Gathers criteria with which to base the trip summary report on. Criteria can include Vessel(s), Skipper, date range, species, etc.
  - View Trip Summary
    Displays all trip information, details about fish caught during that trip and a GPS-type map that displays the vessel's course.
  - Crew
    Displays all of the crew information for that Trip.
  - Analysis
    Displays a chart that features the catch by category and the allowable catch.

- Hours to Reach Quota (HTRQ)
  This report is a graphical display about how many hours it took to reach a quota for a particular species.
  - Query
    Gathers Vessel, Skipper, and Species information.
  - HTRQ Chart and Table
    Displays the species, start date, and date, and the hours it took to reach the limit for that species.

- Quota Status
  This report gives a graphical representation of quota and how close a fisher is to reaching

their quota for each quota category.
- Query
  Gathers Vessel and Skipper information.
- Quota Status Chart and Table
  Displays landed and discarded catch as a percentage of limits for a given species.
- Fish Detail
  Displays the detail information for a particular species selected from the above chart.

- CPUE
  Catch Per Unit Effort.
  - Query
    Gathers catch and vessel information.
  - CPUE Chart

4.7.1.7(b) Logbook

Displays all information that the onboard ship application captures. This version is read-only once the trip report has been completed (as opposed to the official port biologist's version).

- Query
  This Query screen captures vessel name, vessel skipper, or a date range.

4.7.1.7(c) Fish Ticket

Displays all information that the processor application captures. This version is read-only once completed (as opposed to the official port biologist's version).

- Query
  This page captures date, ticket ID, vessel skipper, and/or vessel name to find a particular fish ticket.
- View Fish Ticket
  This page displays all information that the processor application captures.

4.8 Central Database Connection Subsystem

The central system uses the CDC subsystem to manage all communications between the central system and the deployed onboard systems. This middle tier subsystem is responsible for receiving and processing transactions from each of the vessels. Once a transaction is received and validated, this subsystem will then respond by returning either a confirmation or the requested information to the vessel's onboard subsystem.

Data will be transmitted between the CDC and the onboard system on request. This data reflects information used to prepare for a trip, and to report about a trip. This data will be passed in a set

of fixed records that facilitate EDI. Records have been defined in order to economize the volume of data that will be transmitted. In addition, the system makes use of its ability to cache information to allow skippers alternatives for what they transmit and when. Skippers will be able to transmit a minimal amount of time sensitive information while they are underway and make use of more economical communications capabilities before they leave, and once they return, to transmit the higher volumes of information.

To secure the information, each transaction will be secured and signed with a public key certificate of both the identity of the person reporting, and the identity of the destination system (i.e., the CDC). By signing it with both of these, the transaction can be authenticated to the person reporting the information and will ensure that it is only useful if received at the CDC.

The central system serves as the central collection point for all information. To load information to this system, the system makes use of the CDC subsystem, which is made up of the following modules:

4.8.1 Communication Services

Messages will be received via an SMTP mail handler. Public DNS entries will allow the mail to be directed to the mail service based on addressing in the mail header that was constructed by the onboard application.

4.8.2 Security

Once a message is received, the application on the server will periodically check the SMTP mail service and retrieve all new messages. Using the public key available via the local certificate server and the private key for the server, each message will be authenticated, decrypted and will extract the transactions contained within it.

4.8.3 Transaction Manager

As discussed before, EDI transactions have been defined to support all communications between the central system and the onboard subsystem. The transaction handler will be responsible for constructing and interpreting all of these transactions. As the system receives a transaction, this module will interpret and validate the contents of each transaction. Once a transaction has been validated, appropriate action will be taken. Data will be stored in the central database.

A new transaction will be constructed as necessary. These transactions will be transmitted as secure MIME mail messages that will be addressed to the vessel. As a vessel connects, it will transmit any outstanding transactions/messages and check for new messages.

In Appendix E each transaction specification identifies the validation criteria and the actions to be taken based on the validation results. Most transactions will issue either a response, or a

confirmation.

4.9 Administration Specification

There are several master data tables that contain system-wide standard information. The organization or agency that ultimately is responsible for the database will maintain this information. This section describes the forms that will be used to access this information and some standard items that will appear on them.

4.9.1 Buttons

4.9.1.1 Rollback

This button will remove any uncommitted change made to an item.

4.9.1.2 Enter Query

This button will clear the form, perform a rollback if necessary, and place it in a state that will allow the user to enter selection criteria into the form. All of the fields in the forms will be able to be queried.

4.9.1.3 Execute

This button will submit information in the form to the database as a query, returning any information meeting the criteria specified.

4.9.1.4 Commit

When changes have been made to the record on the screen this button will commit those changes to the database.

4.9.2 Status Bar

4.9.2.1 Username

The username of the individual using the system will be displayed here.

4.9.2.2 Record Status

The status of the current record will be displayed here.

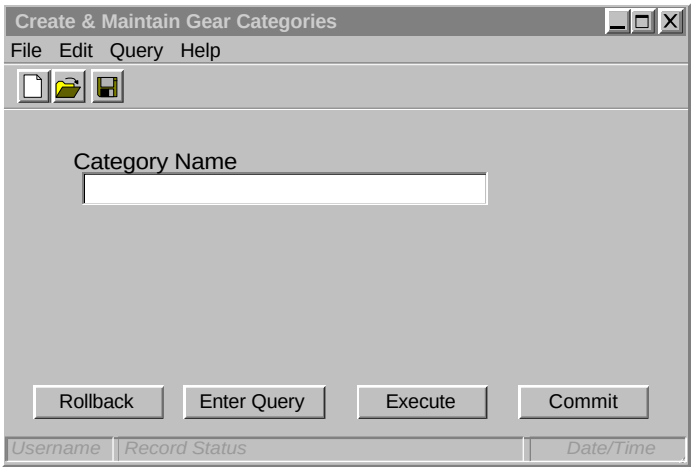
4.9.2.3 Date/Time

The current system date and time will be displayed here.

4.9.3 Maintenance Forms

4.9.3.1 Maintain Gear Categories

This form allows maintenance of data in the Gear Categories. These categories will be used in conjunction with the gear characteristics.



4.9.3.1(a) Category Name—This is free form text field. The user will enter the various gear categories (i.e., trawl, pot, soak, longline, etc.).

4.9.3.2 Maintain Gear Characteristics

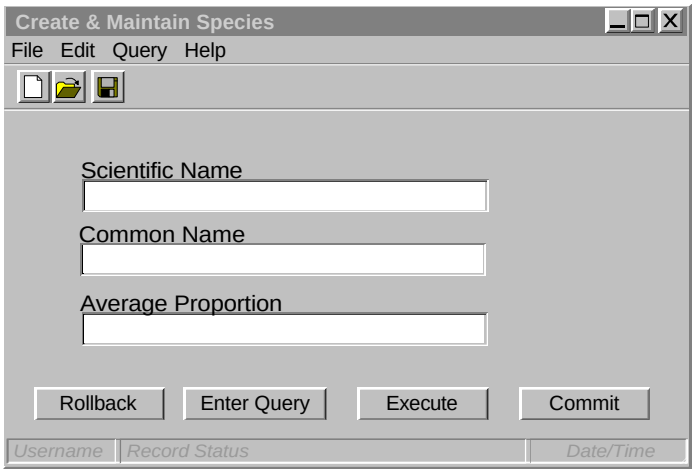
This form allows maintenance of the Gear Characteristics table. This will associate specific characteristics with a category.

This is a system-generated value. The user cannot create or change it.

Category Name—This is a list box that will display the currently entered categories.

Characteristic Name—This field is a free-form text field. The user can enter the name of the characteristic.

4.9.3.3 Maintain Species



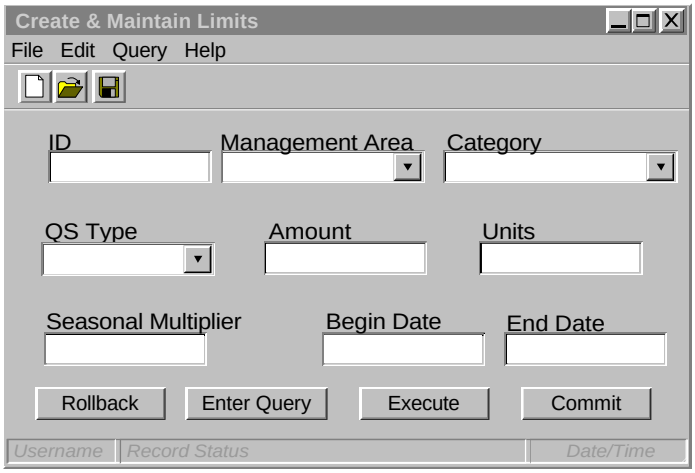
This form allows maintenance of the species table. This table will be loaded with the most common species combinations for the local region, with the entire listing available for loading if necessary.

Scientific Name—This field allows the user to enter the species name.

Common Name—This field allows the user to enter a common name reference.

Average Proportion—This field allows the user to enter the market category proportion for this species.

4.9.3.4 Maintain Limits



This form allows maintenance of the limits table. The limits table contains the fish catch limits for the management areas in a region. A limit is tied directly to a category, which is tied to a permit.

In this way the system can determine the permitted amount for any permit.

ID—This is a system-generated value. The user cannot create or change it.

Management Area—This is the management area associated with this limit. The user will select it from a list of values.

Category—This is the category associated with this limit. The user will select it from a list of values.

QS Type—This is the type of quota share (QS) that may be associated with this limit. The user will select it from a list of values.

Amount—This is the number of units of fish that can be caught. (See next item.)

Units—This is the unit of weight associated with this limit.

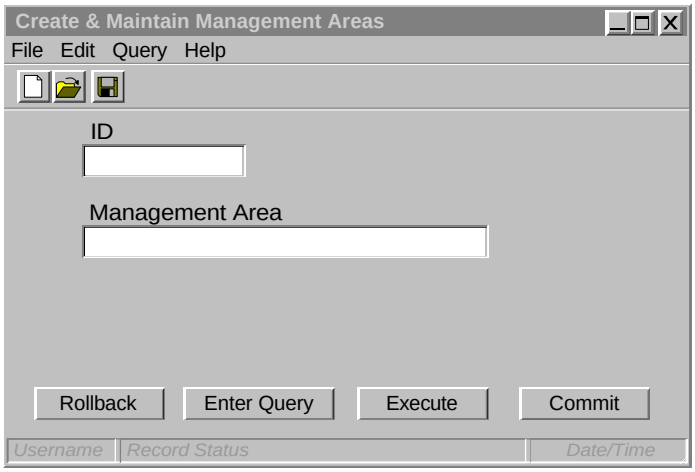
Seasonal Multiplier—The multiplier is a number that is multiplied by the number of quota shares owned by the quota owner to determine the actual quota share for the owner during the quota period.

Begin Date—This is the first day that this limit will be enforced.

End Date—This is the last day that this limit will be enforced.

4.9.3.5 Maintain Management Areas

This form allows maintenance of the fishery management area names.

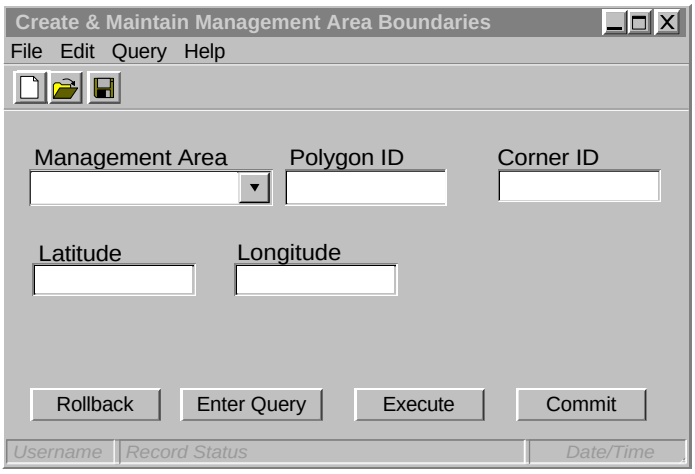


ID—This is a system-generated value. The user cannot create or change it.

Management Area—This is a free form text field. The user will enter the name associated with the management area.

4.9.3.6 Maintain Management Area Boundaries

This form allows maintenance of the boundaries for a management area. These boundary points will form a polygon.



Management Area—This is the management area associated with this boundary. The user will select it from a list of values.

Polygon ID—This is the identification field that uniquely identified this entire polygon.

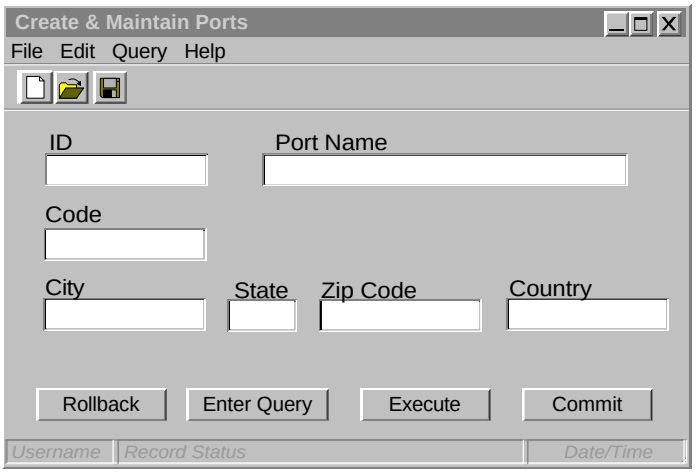
Corner ID—This is a sequential number representing each of the corners of the polygon.

Latitude—This is the latitudinal position of this corner.

Longitude—This is the longitudinal position of this corner.

4.9.3.7 Maintain Ports

This form allows maintenance of the ports table. This table will contain the information about a port-of-call.



ID—This is a system-generated value. The user cannot create or change it.

Port Name—This is the name of the port.

Code—This is a code that is used by parts of the system to identify this port.

City—This is the city in which the port is located.

State—This is the state in which the port is located.

Zip Code—This is the zip code for the city in which the port is located.

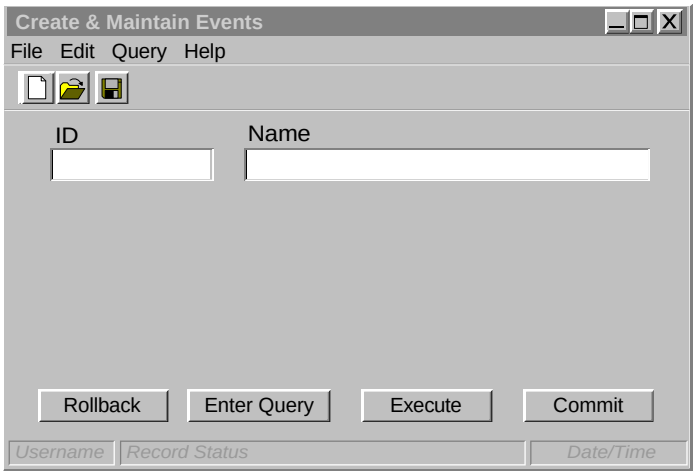
Country—This is the country in which the port is located.

This is a system-generated value. The user cannot create or change it.

Characteristic Name—This field is a free form text field. The user can enter any thing for the name of the characteristic.

4.9.3.9 Maintain Events

This form allows maintenance of the events table. These events can be associated with a specific fishing activity or used independently.

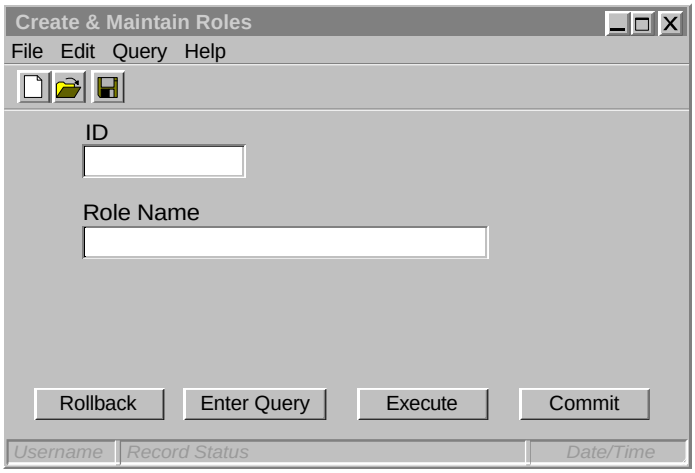


ID—This is a system-generated value. The user can not create or change it.

Name—This field is a free form text field. The user can specify the name of the event.

4.9.3.10 Maintain Roles

This form allows maintenance of the roles table. These roles are assigned to participants in the system to show how they relate to the information. Some of the roles are skipper, processor, crew member, and observer. The roles also relate to the security that is functioning in the system.

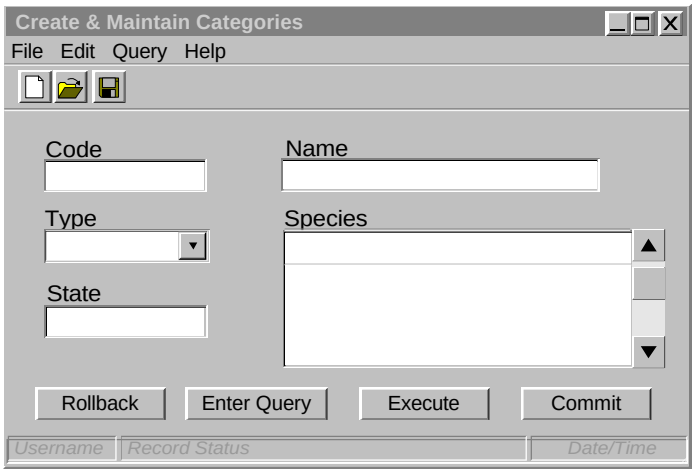


ID—This is a system-generated value. The user cannot create or change it.

Role Name—This field allows the user to enter whatever they want here.

4.9.3.11 Maintain Categories

This form allows maintenance of the categories table. This form allows one or more species items to be assigned to a category.



Code—This field allows the user to enter the category code that will be associated with this category.

Name—This field allows the user to enter the name of the category.

Type—This field allows the user to select where this category code will be used (i.e., logbook, fish ticket, biological sample, etc.).

State—This field allows the user to enter the 2-digit state code that uses this category code.

Species—This field allows the user to select all species and/or market categories that are to be included in this category.

APPENDIX A: SYSTEM DESIGN CHANGES

The EFCL System Design Document has undergone an extensive rewrite to incorporate changes identified during analysis of related efforts. In addition, a considerable amount of work has been completed to refine the design definition for components of the system architecture. To document the evolution of the document, this appendix describes the changes that have been incorporated.

Integrating the collection of observer data from the following list of observer programs has been incorporated in the system design for the prototype EFCL.

- **NOAA/NMFS Northeast Region:** NMFS Fisheries Observer Program Vessel and Trip Information Log; NMFS Fisheries Observer Program Longline/Line Trawl Haul Log; NMFS Fisheries Observer Program Longline/Line Trawl Gear Characteristics Log; NMFS Fisheries Observer Program Drift Gillnet Gear Characteristics Log; NMFS Fisheries Observer Program Drift Gillnet Haul Log; NMFS Fisheries Observer Program Sink Gillnet Haul Log; NMFS Fisheries Observer Program Sink Gillnet Gear Characteristics Log; NMFS Fisheries Observer Program Crustacean Sample Log; NMFS Fisheries Observer Program Scallop Dredge Off-Watch Haul Log; NMFS Fisheries Observer Program Scallop/Mussel Dredge Haul Log; NMFS Fisheries Observer Program Scallop/Mussel Dredge Gear Characteristics Log; Trawl Haul Log; NMFS Fisheries Observer Program Pair Trawl Gear Characteristics Log; NMFS Fisheries Observer Program Trawl Gear Characteristics Log; NMFS Fisheries Observer Program Lobster, Crab & Fish Pot Haul Log; NMFS Fisheries Observer Program Lobster, Crab, & Fish Pot Gear Characteristics Log; NMFS Fisheries Observer Program Marine Mammal and Sea Turtle Biological Sample Log; NMFS Fisheries Observer Program Marine Mammal, Sea Turtle, and Sea Bird Incidental Take Log; NMFS Fisheries Observer Program Marine Mammal; NMFS Fisheries Observer Program Sea Turtle; and Debris Daily Sighting Log; NMFS Fisheries Observer Program Length Frequency Log; and NMFS Fisheries Observer Program Photo Log.

- **Oregon Department of Fish & Wildlife** and Oregon Trawlers Association Enhanced Groundfish Data Collection Project: Halibut Physical and Biological Data Form; Salmon Physical and Biological Data Form, Blank Species Composition; Total Discard Estimate; At Sea Summary and Fishing Location Form; Groundfish EDCP Trawl Discard Logbook Instructions; Groundfish EDCP Trawl Discard Logbook; and Groundfish EDCP Trawl Net Description.

- **NMFS Southeast Fisheries Science Center**: Pelagic Longline Observer Program Longline Haul Log; Southeast Fisheries Science Center Individual Animal Log; and Pelagic Longline Observer Program Longline Gear Log.

- **NMFS Southwest Region**: Hawaii Longline Observer Vessel Specifications Record; Hawaii Longline Daily Effort Record; Hawaii Longline Protected Species Interactions and Sighting Record; Hawaii Longline Longline Gear and Set Data; Hawaii Longline Protected Species Tally Sheet; Hawaii Longline Catch Tally Sheet; Hawaii Longline Sea Turtle Life History Form; Hawaii Longline Marine Mammal Life History Form; Hawaii Longline Fish Life History Data; NMFS Daily Lobster Sea Sampler Catch Report; Drift Gillnet Observer Gear and Set Data; Drift Gillnet Observer Catch Tally Sheet; Drift Gillnet Observer Non-Fish Tally

Sheet; Drift Gillnet Observer Fish and Invertebrate Measurement Data; Drift Gillnet Observer Shark/Billfish Life History Data; and Drift Gillnet Observer Sighting Record.

- **NMFS Office of Protected Resources**: Marine Mammal Authorization Program Mortality/Injury Reporting Form.

- **British Columbia (Archipelago Marine Research Inc.):** Longline Catch Estimation Form; Length Frequency Data Form; Otolith Sample Data Form; Salmon Data Form; Halibut Data Form; Marine Mammal Sighting Form; Observer Catch Estimation Form; Halibut Data Form; Discarded Marketable Species Worksheet; Data Form for Tagged Fish Other Than Salmon; and Halibut Mortality Worksheet.

- **Alaska Fisheries Science Center**, Ground Fish Observer Program: All Forms for the mandatory Observer program.

A.1 Summary of Changes

The following is a summary of changes that were incorporated into the EFCL Design Document

- Minimal adjustments were made to the list of system functions to clarify and correct business operations that will be supported.
- The system architecture has been defined in more detail. The design is intended to provide a consistent modular architecture that can be tuned for regional implementation needs.
- The database design has been changed. Most changes made to the database design were made to ensure that the system would support the standard statistical model and other analysis needs.
- A set of Electronic Data Interchange (EDI) transactions has been defined to standardize the way that information is exchanged between the shipboard application and the central data system.
- A detailed specification has been provided that identifies how system security will be implemented.
- A detailed specification has been provided that identifies how the system will manage spatial data and integrate with Geographic Information Systems (GIS).
- Adjustments have been made to allow the system to support the needs of observers.
- Adjustments have been made to provide an option to collect basic economic information.
- Adjustments have been made to integrate the use of a commercial onboard application. This application is being provided by one of the Cooperative Research and Development Agreement (CRADA) partners.

A.2 Document Version Cross-Walk

As part of the effort to incorporate these changes, the structure of the document has also

changed. The following table presents a cross-reference between the document structure of the July 1998 document and this revised version of the document.

July 1998 Stage 2 Draft Design	April 1999 Stage 2 Final Design
Section 1: Introduction	Section 1: Introduction
Section 2: Project Strategy	
Analysis Report	
Section 3: Design Objectives	
Section 4: Operational Processes	Section 3: Operational Processes
Section 5: Functional Requirements	Section 2: Functional Requirements
Draft System Design	
Section 6: System Architecture	Section 4: System Architecture
Section 7: Data System Design	Section 5: Database Specification
Section 8: Module Specifications	Section 6: Transaction Specification Section 7: Security Specification Section 8: Communication Specification Section 9: GIS Specification Section 10: Onboard Application Subsystem Section 11: Web Application Subsystem Section 12: Central Database Connection Subsystem Section 13: Administration Specification

Appendices

	Appendix A: System Design Changes
Appendix A: Project Plan	
Appendix B: Draft Web Application User Interface Specification	
Appendix C: Draft Onboard Application User Interface Specification	
	Appendix B: System Table Definitions
	Appendix C: Transaction Module Specification

Due to the significantly expanded content in the module specifications and system architecture, there is little value in identifying discrete changes – the new versions are essentially a complete rewrite of the previous content.

It is important to note, that with the exception of some minor changes to address typographical errors, the Appendices for the mocked up of the web application and the onboard application are almost the same as those presented in the July 1998 document. This content was intended to provoke debate on the organization of data and to some extent was successful.

During the prototype development phase (Stage III), a commercial vendor will be providing the onboard application. The look and feel of the application will be driven by the design of the commercial application. In addition, it is expected that during Stage III, the website will take on a more polished appearance.

A.3 Summary of Database Changes

While many of the sections of the document represent a comprehensive rewrite since previous content was not given to any depth, the initial data system specification was detailed. In light of this, the following section provides insight into the changes that were made as part of the release of this document.

If there is a need to do a discrete change audit, the data system design is contained in an Oracle Designer 2000 repository. This repository retains a version history that will identify all changes explicitly. This information is available on an as requested basis via the Principal Investigator for the project.

The following is a summary of the changes that have been made to the EFCL data system:

- Several tables were added to allow for the gathering of economic related data. Providing this information is optional.
  - Ancillary Equipment.
  - Propulsion System.
  - Process Equipment.
  - Structure Mod (Structure Modifications to a vessel).
  - Consumable Type.
  - Consumable Item.
- More detail was added to the Biological Sample entity to provide effective evaluation of the sampled specimens.
- Additional attributes were added to the Specimen entity to capture weight.
- Additional attributes were added to the Catch entity to capture the necessary logbook information.
- Additional attributes were added to the Fishing Activity entity to capture the necessary logbook information and GIS spatial data.
- A Configuration entity was added to keep vessel specific information.
- The Gear Type and Gear Characteristics entities were changed to allow for greater specification of gear specific information.
- The Genus and Species entities were removed since it was determined that they were redundant.
- Issuing Authority was added as an entity. This allows for a single point of contact in the agency.

- Additional attributes were added to the Landing entity.
- Additional attributes were added to the Management Area entity to capture the GIS spatial data.
- The Management Area Boundary entity was changed to include two sub-entities. These entities are Polygon and Offset. They represent the different types of boundaries that can be defined.
- The Fishing Activity Location entity was renamed Marker Location.
- The entity Event was added to allow for specifying that an event occurred at a specific location. This entity is tied to Fishing Activity Location.
- The entity Marker Location was added to allow for the capturing information that the skipper wants to keep. These markers can contain anything.
- To provide for different types of permits or quota shares, additional attributes were added to the Limit entity.
- The entity Trip Role was renamed Participant Trip Role.
- The entity Permit was renamed and additional attributes were added to allow for all type of permits or licenses.
- The Person entity was renamed Participant. The Processor entity was rolled into the new Participant entity.
- The entities Quota Share and Quota Share Trip were added to allow for different types of permits to be utilized by the system.
- Additional attributes were added to the Vessel entity to provide greater information about the vessel.
- Since several participants may own a vessel the Vessel Ownership entity was added.
- Two entities were added to provide an efficient means of synchronizing the system, and to keep track of the transactions that have been processed, two entities were added. They are Synchronize and Transaction.
- The attribute Spatial Item Icon was added to the following tables: Trip, Fishing Activity, Management Area, and Management Area History. This attribute will contain the spatial item for a value in the entity.
- The entities Protected Species Type, Protected Species Characteristic, Protected Species Value, Tag, and Protected Species Incidental Take were added for use by observers and

fishers to report takes of protected species.

- The entity Protected Species Sighting was added for the fishers and observers to report sightings of protected species.

- The entities Fishing Activity Type, Fishing Activity Characteristic, and Fishing Activity Value were added for the observers to record information about the different fishing activities that occur.

- The entity Fishing Gear was added so that a group of characteristics could be associated together for easy reference.

APPENDIX B: FUNCTIONAL REQUIREMENTS

Based on the analysis performed, a comprehensive functional decomposition has been created. This breakdown identifies all of the functions that the system may need to perform. The following is the detailed decomposition of required system functions:

Collect Logbook Data

Collect data about each logbook activity to provide for more efficient management of the resources.

Maintain Vessel Data

The following group of functions will allow the information system manager (user) to validate and maintain the data relevant to a vessel. These functions will allow for creation, modification, and deletion of the vessel data. The function will allow the user to query for a list of vessels and then select the appropriate vessel.

Maintain data that identifies the vessel

This function will allow the user to input and update the various local, state and federal identification numbers that a vessel is required to have. This will provide a way to keep the entire set of identity information in one record and not in individual records on different systems.

Maintain vessel description characteristics

This function will allow the user to input and update the various characteristics of a vessel. These characteristics might include the refrigeration capacity, the vessel tonnage, engine horsepower, and details about sonar, radar, or sounder. Some of this information could be used later in calculation of the cost-per-unit-effort reports.

Maintain vessel contact information

This function will allow the user to input and update the information relating to how the vessel can be contacted. This will include the vessel's VHF Call Sign and a cellular phone number that might be associated with the vessel.

Maintain vessel permit information

This function will allow the user to input and update the permit numbers that are associated with vessels and/or persons.

Maintain quota shares

This function will allow the authorized user to update and maintain the quota share table. The authorized user can query a specific participant's quota share data and make changes to its attributes or can enter new quota share data.

Maintain vessel ownership

This function allows the user to maintain the ownership information for a vessel.

Maintain Trip Data

This group of functions allows the user to enter data regarding a fishing trip. This data could be entered manually or could be entered automatically based on the most recent fishing trip. The user would initiate this automatic process shortly before beginning the fishing trip. The process will retrieve the necessary data about the vessel, permit, and the crew. This data could then be updated as needed by the user.

Collect crew data

This function will collect information about crew members who were on a trip. The crew data will be used to maintain finance and labor records and will support the calculation of catch-per-unit-effort (CPUE) reports.

Collect data on ports of call

This function will maintain a master list of port names and report on ports that are visited during a trip.

Collect consumable data

This function will maintain data regarding the consumables used during the fishing trip. Consumables are diesel and food stores. Consumable data can be used in the calculation of CPUE reports.

Query permit quota status

This function will report the current permit limit status for a skipper/fisher in a given fishery. This report will show the catch remaining on the permit for the current fishing period.

Maintain data on cautions and hazards

This function will provide for the collection of data regarding navigational hazards. The type of data could be related to problems on the bottom or areas where the currents are too strong for a specific type of gear, etc.

Maintain fisherman's diary

This function will collect personal data about the fishing trip. This data will be collected free-form. This data will be treated privately and will be available only to the user who made the report.

Collect Catch Data

This group of functions is used for recording data about an individual catch event.

Collect target catch data

This function will allow the fisher to identify what species of fish they were fishing for. This will be used to correlate with catch and discard data.

Collect fish caught data

This function will allow the user to report data about the species of fish that were caught during a fishing event and the estimated weight or number of each species or category.

Collect discard estimates data

This function will allow the user to report an estimated weight of the species or category of fish that were discarded.

Collect retroactive discard data

This function could allow the user to enter discard data for previous catches. Retroactive discards occur when less profitable fish are landed early in a fishing trip and later in the trip more profitable fish are landed. The less profitable ones would be discarded and recorded as retroactive discards. This function will be developed if regional fishery requires this information

Collect environment data

This function will collect data from sensors about the fishing environment. Sensors will either be

directly connected to the system or capable of performing data downloads. Sensor data must contain a date-time stamp that will allow it to be synchronized with other reported data.

Collect GPS trace data for fishing activity

This function will interface with a Global Positioning System (GPS) to collect data during fishing operations. The GPS will be connected to the onboard system. GPS data must contain a date-time stamp that will allow it to be synchronized with other reported data. The system will associate a “GPS trace” with other information reported about fishing events to allow spatial analysis.

Collect vessel activity data

This function will allow collection of vessel’s course and speed. This data may be used in the development of CPUE.

Collect rigging/gear data

This function will collect reports on the type of gear used for a fishing event. These reports will be made using predefined lists of gear to ensure consistent reporting.

Collect catch notes

This function will allow the user to enter any "general notes" about the fishing activity. This is a free-form entry. This data would only be available to the user.

Collect observation data

This function will allow an observer to enter data regarding any catch observations or samples taken.

Collect protected species data

Provide for collection of information about sighting, catch or discard of protected species, and the interaction associated with the fishing activity.

Collect Landing Data

This group of functions is used to gather data about the landing of fish. This data will be used when creating the Fish Ticket.

Collect Fish Data

This function will collect reports on the fish that are landed and the type of gear used to catch them. Fish may be reported in market categories/species. For each category/species the weight of landed fish will be collected. The system will allow collection of "weigh back" values for poor quality fish.

Collect processor data

This function will collect data about the processor where the fish are being landed.

Collect landing notes

This function will allow collection of free-form notes related to the landing.

Collect catch location data

This function will store the fisheries management area where the fish were caught. This information will either be entered by an authorized person, or will be derived from reports made to the onboard logbook system.

Collect Sample Biological Data

This function will allow users to record data about the biological samples they take.

Collect species composition data

This function will record information used to identify the species composition of a sample.

Collect specimen data

This function will record detailed information about any individual specimen (single fish).

Support Analysis of Information

These functions are used in reporting and analyzing fishing activities. The logbook and fish ticket reports are mandatory (in WOC limited-entry trawl fleet) and must be maintained on the vessel for a period of time. The other functions are used to analyze fishing activities to better manage the resource and improve efficiency of fishing activities.

Reproduce Paper Transactions

This function will produce acceptable reproductions of paper reports that are required by either state statutes or enforcement agencies.

Print logbook reports

This function will produce acceptable reproductions of paper logbook reports.

Print fish tickets

This function will produce acceptable reproductions of paper fish tickets. Note: these have a different format for each state.

Provide For Analysis Reports

These functions are used to analyze fishing activities. The fishers, researchers, or resource managers might perform this analysis. Access is controlled to these reports to ensure only authorized personnel obtain information regarding specific fishing events.

Trip summary report

This function will allow the user to obtain a summary of all information associated with a trip.

Catch summary report

This function will allow the user to obtain a summary of all information associated with the catches on multiple trips.

Efficiency report

This function will allow the user to obtain a report on a quota basis to identify how quickly quota is being reached.

Quota status report

This function will allow the user to obtain a report that summarizes the status of their quotas. This report will indicate the weight of fish that can still be caught.

CPUE report

This function will allow the user to obtain a report detailing CPUE.

Provide for ad hoc analysis

This function provides for ad hoc queries that will report on information from multiple fishing events that the user is authorized to access.

Produce an observer report

This function will allow the user to query a list of trips for a vessel and select trips associated with the observer report. This report will then print the relevant data relating to the trips.

Provide resource management reports

This function will allow authorized users to develop summary reports for specified management areas.

Maintain Historical Records

This function will maintain historical records of all transactions. Some records will be used for "point in time" reporting while others will be use for audit purposes.

Support Electronic Interfaces

This function will allow for the exchange of data either between the onboard application or with other data systems.

Shipboard access

This function will provide an interface to the onboard application that will record information during a trip. It will provide the ability to transfer data to initialize a trip log before leaving port and provide for secure data transfers during the trip across a wireless or satellite network. It will provide for the transfer of trip information via an Internet connection and provide for interim or complete reports.

Processor call-ahead support

This function will provide the ability to notify a processor, via the World Wide Web, of an incoming catch.

Web access

This function will provide for secure web access to the central data system, provide the ability to update reports via the web as well as to obtain analysis reports and support all data entry for official port biologists and processors via the web.

Access to electronic messaging

This function will integrate with electronic mail services.

Database interfaces

This function will support database-to-database interfaces to transfer information.

Provide Access to Related Information Sources

This function can provide access to the following information via links to related websites.

Access to current diesel prices

This function can link to a site what has fuel prices for various areas.

Access to processor pricing

This function will be a link to a site that has the pricing information currently being offered by a processor.

Provide a job bulletin board

This function will allow skippers to post crew-wanted notices and crew to respond.

Access to national weather service reports

This function will be a link to a site that is the National Weather Service web page and related weather information.

Access to Coast Guard safety alerts and bulletins

This function will be a link to a site that is the Coast Guard’s web page.

Access to quotas and fishing regulations

This function will be a link to a site that has the fishing quotas and regulations posted.

Access information regarding other information links

This function could be a link to a site that has local entertainment listings, for example.

Support System Maintenance

These functions are the general system functions that are needed to properly maintain the system. An authorized system administrator will make changes to these tables. These changes would be propagated to the shipboard application database tables the next time the synchronization process is executed.

Control Access to Information

This function will provide system security. It will support definition of roles and will be used to authenticate users and determine which information is available for them to view.

Provide Historical Integrity

Since the system will provide a historical record of reported information, it is important that as definitions change the system is able to retain information in such a way that information under old and new definitions can still be correlated. This function will provide historical system integrity.

Maintain market categories

This function will allow the authorized user to update and maintain the category table. The user can query a particular category and make changes to its attributes, or can enter an entirely new category.

Target strategy definition

This function will provide for defined categories of fishing strategies.

Track quotas

This function will allow information regarding quotas for different fishers in different fisheries to

be recorded so that quota management reports can be developed.

Maintain management areas

This function will allow for creation and update of the management area table. It will also allow a management area to be marked as active or inactive.

Definitions of Catch Per Unit of Effort (CPUE)

The ability to calculate CPUE is a key factor in the management of resources and fishing operations. The system must provide the ability to define at least one method of calculating this factor, as well as changes to the formulation over time.

Maintain protected species characteristic data

This function will allow the user to update and maintain the protected species characteristics table. The user can query a protected species characteristic and make changes to its attributes or can enter an entirely new protected species characteristic.

Maintain Master Data

Maintain participant data

This function will allow the authorized user to update and maintain the participant table. A participant is defined as any individual, corporation, partnership, or entity that will be referenced by or used in the system. The authorized user can query a specific participant and make changes to its attributes or can enter an entirely new participant.

Maintain management area boundary data

This function will allow the authorized user to update and maintain the management area boundary table. The authorized user can query a specific management area boundary and make changes to its attributes or can enter an entirely new management area boundary.

Maintain management area limit data

This function will allow the authorized user to update and maintain the management area limit table. The authorized user can query a specific management area limit and make changes to its attributes or can enter an entirely new management area limit.

Maintain species data

This function will allow the authorized user to update and maintain the species table. Authorized users can query a specific species and make changes to its attributes or can enter new species.

Maintain gear categories

This function will allow the authorized user to update and maintain the gear category table. The authorized user can query a specific gear category and make changes to its attributes or can enter an entirely new gear category.

Maintain gear characteristics

This function will allow the authorized user to update/maintain the gear characteristic table. The authorized user can query a specific gear characteristic and make changes to its attributes or can enter an entirely new gear characteristic.

Maintain port data

This function will allow the authorized user to update and maintain the port table. The authorized user can query a specific port and make changes to its attributes or can enter an entirely new port.

Maintain role data

This function will allow the authorized user to update and maintain the role table, for example to assign the user privilege of a biologist to a biologist. The authorized user can query a specific role and make changes to its attributes or can enter an entirely new role.

Maintain issuing authority data

This function will allow the authorized user to update and maintain the issuing authority table. The authorized user can query a specific issuing authority and make changes to its attributes or can enter an entirely new issuing authority.

Maintain configuration data

This function will allow the authorized user to update and maintain the configuration table. The authorized user can make changes to the configuration table attributes or can enter the initial system configuration.

APPENDIX C: OPERATIONAL PROCESSES

Beyond the functional requirements stated above, the primary drivers in the system design are the fishing processes the system must support. Figure C1 provides the operational process flow diagram for the fishing processes the EFCL project is designed to address.

Current Commercial Fishing Processes

The following is a breakdown of the current commercial processes that this project is concerned with.

- A vessel is usually used to fish (boats may also be used to fish and some fishing is shore-based).
- The vessel has a skipper who is the primary person in charge of the fishing operations.
- A crew typically accompanies the skipper on a trip.
- The skipper may or may not be the vessel owner. Therefore, the skipper may or may not be bound to share information with the owner.
- The skipper is responsible for logbook reporting.
- There may be an observer onboard the vessel. Observers are typically used to gather "fishery independent" data.
- Observers typically fill out a logbook report reporting catch, discard and other information, whether or not the skipper is also required to report information.
- Observer logbook entries are typically made on paper, but they may also be made on computers provided on the vessel or by the observer’s organization.
- The observer is likely to be involved in the taking of samples from the catch and discard, may measure attributes of individual specimens, and may collect fins, otoliths, scales or other parts of the caught species (for example, PIT tags).
- Observers may also be used to gather information about interactions between the fishing activity and species that are listed under the Marine Mammal Protection Act, or birds and amphibians that are listed for protection.
- A vessel is taken out on a trip, which may last hours, one day, or many days (usually less than seven on the Pacific WOC coast).
- As part of the trip, there are fishing activities (a trawl, a soak, a line cast, a pot drop, a pot retrieval, etc.).
- The skipper may have one or more target strategies for each fishing activity. A target strategy is a species of fish that the skipper is hoping to catch.
- Different types of gear are used to perform the fishing activities.
- For at-sea processing, a catcher vessel relates to the at-sea processor vessel as if the catcher vessel were making a shore-based landing.
- Depending on management rules, logbook entries are made for each activity, and for each species of fish caught. Entries are also made for fishing activities that do not result in a catch. These entries identify the gear used, the location and depth of the activity, and the estimated weight of fish caught.
- Depending on management rules, a fisher may choose to discard some or all of the fish that they have caught due to catch condition, market value, or the status of the fishers' quota.

  Fishers may choose to report these discards (although there is no requirement to do so in

WOC at present).

- In the WOC groundfish fishery there are plans to allow a fisher to choose to retain a limited overage with the catch being sold for research.
- At the end of a trip, the sum of all catches, less the discards, is landed at one or more processors.
- Processors pay the fisher for their landed catch based on its category, weight, and condition.
- An enforcement officer may assess a penalty. The overage may be reported on the fish ticket (or a new fish ticket) if the fisher has exceeded his quota. A citation may be issued.
- A fish ticket may be issued to register credit for research services rendered. This fish ticket would allow the fisher to fish in exchange for these services.
- A fish ticket may be used to report fish that the fisher landed but retained for personal use.
- The processor provides a copy of the fish ticket and tax reports to the state so that the state can track revenues and fishing activity. Some fish tickets are provided to federal agencies rather than state agencies.
- A processor may assess a discount based on poor quality of the landing. This may be expressed in terms of a weigh-back. A weigh-back is the percentage depreciation on the weight of the landed catch.
- An official port biologist may take a sample from the fish that are landed to determine the species composition and record key characteristics about the sampled specimens.
- A copy of the logbook and the fish ticket is sent to or collected by a official port biologist.
- The official port biologist may reconcile the logbook and the fish ticket. Changes may be made to either report, but changes in the logbook are more frequent.
- At any time an enforcement officer may ask a fisher to show the last 60 days of logbook and/or fish tickets (in WOC).

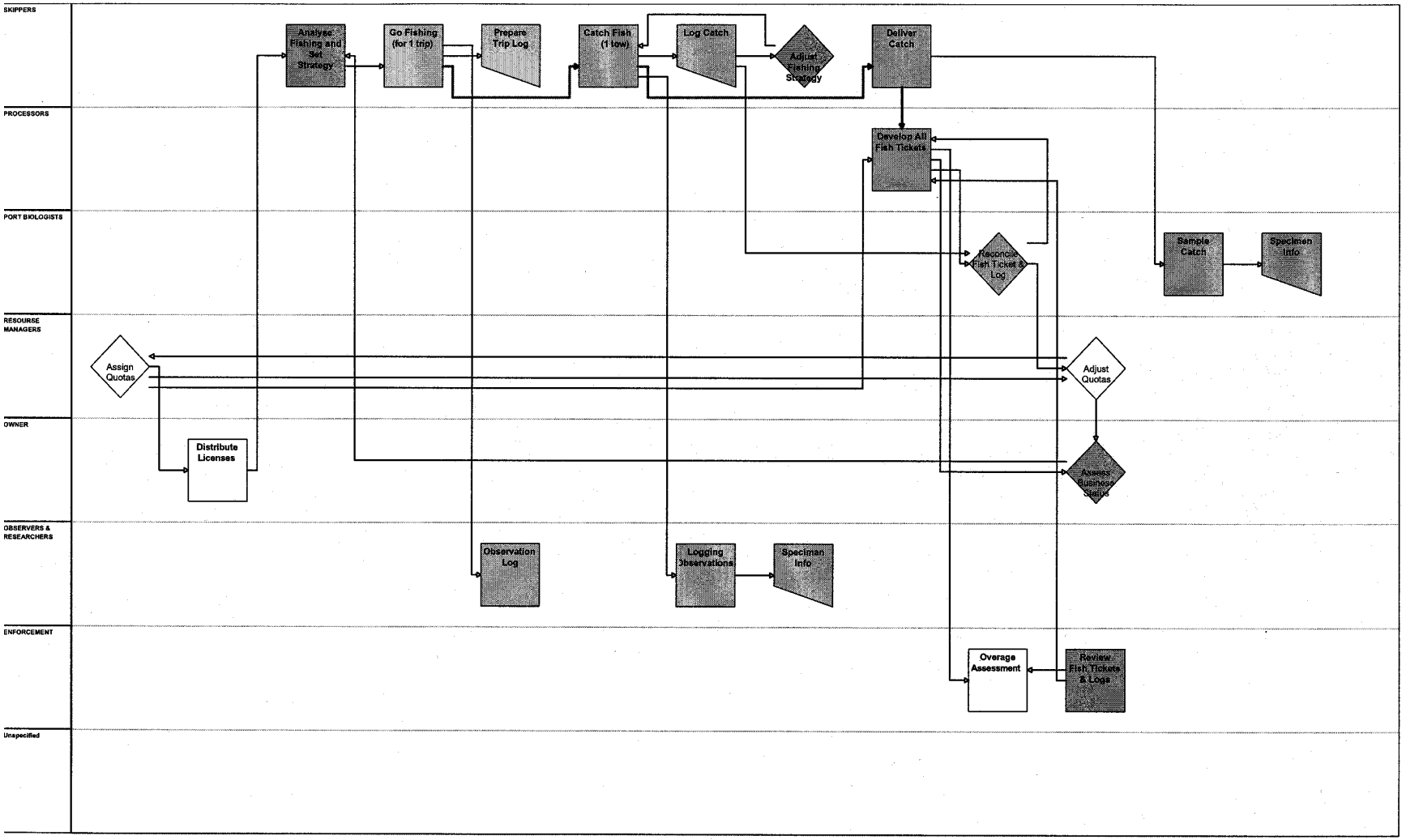


Figure C1. Electronic Fish Catch Logbook Process Flow Diagram

APPENDIX D: SYSTEM TABLE DEFINITIONS

Designer/2000

Report : TABLE DEFINITION
Filename : D:\orant\BIN\cktci2.lis
Run by : DESUSER

Report Date : 27-OCT-99 02:49pm
Total Pages : 117

Parameter Values
Application System : LOGBOOK
Version : 4
Tab/View/Snap Name : %
Diagram :

Includes
Tables Yes
Views No
Snapshots No
Column Details : No

Tables Created
On/After :
On/Before : 27-oct-99
and

Tables Changed
On/After :
On/Before : 27-oct-99

Table Name : ANCILLARY_EQUIPMENT Alias :AE

Display Title : Ancillary Equipment

Object Type:

Comment :

Description : The additional equipment needed to catch, retain and/or process fish

Notes : This entity will contain the data related to the ancillary equipment on a vessel. The primary key for this record will be a combination of the primary key from the vessel and a unique number generated by an Oracle sequence.

User/Help Text :The additional equipment needed to catch, retain and/or process fish

Volumes

Start Rows : End Rows :

Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	TYPE_TYPE	NOT NULL	VARCHAR2 (20)
3	MAKE	NULL	VARCHAR2 (30)
4	MODEL	NULL	VARCHAR2 (30)
5	CREATED_BY	NOT NULL	VARCHAR2 (30)
6	CREATED_DATE	NOT NULL	DATE
7	MODIFIED_BY	NULL	VARCHAR2 (30)
8	MODIFIED_DATE	NULL	DATE
9	VES_HID	NOT NULL	VARCHAR2 (12)
10	VES_CREATED_DATE	NOT NULL	DATE

Primary Key

Name	Column
AE_PK	ID
	VES_HID
	VES_CREATED_DATE

Table Name : ANCILLARY_EQUIPMENT Alias :AE

Display Title : Ancillary Equipment
Object Type:
Comment :

Foreign Keys

AE_VES_FK

VES_HID references VESSELS.HID
VES_CREATED_DATE references VESSELS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----ES_FK_I	----	------D	N---------
AE_VES_FK_I	2	VES_CREATED_DATE	NOT UNIQUE

Table Name : BIOLOGICAL_SPECIMENS Alias :BS

Display Title : Biological Specimens
Object Type:
Comment :

Description : This entity contains detailed information about each individual fish in a species composition.

User/Help Text :This entity contains detailed information about each individual fish in a species composition.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	SPECIMEN_NUMBER	NOT NULL	NUMBER (10)
2	WEIGHT	NULL	NUMBER (3)
3	WEIGHT_UM	NULL	CHAR (1)
4	REPRODUCTIVE_CONDITION	NULL	VARCHAR2 (10)
5	SC_ID	NOT NULL	NUMBER (10)
6	LENGTH_TYPE	NULL	VARCHAR2 (2)
7	LENGTH	NULL	NUMBER (3)
8	LENGTH_UM	NULL	CHAR (3)
9	SEX	NULL	CHAR (1)
10	OTOLITH_TAKEN	NULL	CHAR (1)
11	AGE	NULL	NUMBER (1)
12	AGE_METHOD	NULL	CHAR (1)
13	AGE_STRUCTURE	NULL	CHAR (1)
14	MATURITY_STAGE	NULL	CHAR (1)
15	CREATED_BY	NOT NULL	VARCHAR2 (30)
16	COMMENTS	NULL	VARCHAR2 (30)
17	CREATED_DATE	NOT NULL	DATE

Table Name : BIOLOGICAL_SPECIMENS Alias :BS

Display Title : Biological Specimens
Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
18	MODIFIED_BY	NULL	VARCHAR2 (30)
19	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
BS_PK	SC_ID
	SPECIMEN_NUMBER

Foreign Keys

BS_SC_FK

SC_ID references SPECIES_COMPOSITIONS.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
C_FK_I			N

Table Name : CATCHES Alias :CAT

Display Title : Catches

Object Type:
Comment :

Description : The FISH caught during a specific tow.
Notes : This entity will contain the data related to the individual species of fish caught and represented on an individual line in the existing logbook. The primary key for this entity will be a combination of the primary key from the fishing activity entity and a unique sequential number.

User/Help Text :The fish caught during a specific tow.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	CATCH_NUMBER	NOT NULL	NUMBER (2)
2	MARKET_CATEGORY_CAUGHT	NOT NULL	VARCHAR2 (6)
3	EST_RETAINED_WEIGHT	NOT NULL	NUMBER (6)
4	EST_RETAINED_WEIGHT_UM	NOT NULL	CHAR (1)
5	EST_RETAINED_WEIGHT_METHOD	NOT NULL	VARCHAR2 (2)
6	EST_DISCARD_WEIGHT	NULL	NUMBER (5)
7	EST_DISCARD_WEIGHT_UM	NULL	CHAR (1)
8	EST_DISCARD_WEIGHT_METHOD	NULL	VARCHAR2 (2)
9	FA_ACTIVITY_START	NOT NULL	DATE
10	FA_CREATED_DATE	NOT NULL	DATE
11	CTG_CODE	NOT NULL	VARCHAR2 (4)
12	CTG_CREATED_DATE	NOT NULL	DATE
13	DISCARD_REASON	NULL	CHAR (1)
14	CATCH_NOTES	NULL	VARCHAR2 (250)
15	CREATED_BY	NOT NULL	VARCHAR2 (30)

Table Name : CATCHES Alias :CAT

Display Title : Catches

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
16	CREATED_DATE	NOT NULL	DATE
17	MODIFIED_BY	NULL	VARCHAR2 (30)
18	MODIFIED_DATE	NULL	DATE
19	FA_TRI_VES_HID	NOT NULL	VARCHAR2 (12)
20	FA_TRI_CREATED_DATE	NOT NULL	DATE
21	FA_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
22	FA_TRI_VES_CREATED_DATE	NOT NULL	DATE

Primary Key

Name	Column
CAT_PK	CATCH_NUMBER
	FA_ACTIVITY_START
	FA_CREATED_DATE
	FA_TRI_CREATED_DATE
	FA_TRI_TRIP_NUMBER
	FA_TRI_VES_HID
	FA_TRI_VES_CREATED_DATE

Foreign Keys

CAT_CTG_FK

CTG_CODE references CATEGORIES.CODE
CTG_CREATED_DATE references CATEGORIES.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Table Name : CATCHES Alias :CAT

Display Title : Catches

Object Type:
Comment :

Index Summary

Name	Seq.	Column	Index Type
----CTG_FK_I_1	----	------DE	N---------
CAT_CTG_FK_I_1	2	CTG_CREATED_DATE	NOT UNIQUE
CAT_FA_FK_I	1	FA_ACTIVITY_START	NOT UNIQUE
CAT_FA_FK_I	2	FA_CREATED_DATE	NOT UNIQUE
CAT_FA_FK_I	3	FA_TRI_CREATED_DATE	NOT UNIQUE
CAT_FA_FK_I	4	FA_TRI_TRIP_NUMBER	NOT UNIQUE
CAT_FA_FK_I	5	FA_TRI_VES_HID	NOT UNIQUE
CAT_FA_FK_I	6	FA_TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : CATEGORIES Alias :CTG

Display Title : Categories

Object Type:
Comment :

Description : The group that a genus species has been assigned to.
The marketable categories of fish
The non marketable categories of fish (i.e., protected, endangered, etc)

Notes : This entity will contain the data related to the market categories. These categories can be one or a combination of several species. The primary key for this record will be the code attribute. This code is a 4 character identifier.
This represents the marketable categories of fish as defined by each state or agency.
This represents the categories of fish that are not marketable. They might be protected or endangered.

User/Help Text :The group that a genus species has been assigned to.
The marketable categories of fish
The non marketable categories of fish (i.e., protected, endangered, etc)

Volumes

Start Rows : 0 End Rows : 1000
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	PL_PAR_CREATED_DATE	NOT NULL	DATE
2	PL_CREATED_DATE	NOT NULL	DATE
3	MA_ID	NOT NULL	NUMBER (10)

Table Name : CATEGORIES Alias :CTG

Display Title : Categories

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
4	CODE	NOT NULL	VARCHAR2 (4)
5	NAME	NOT NULL	VARCHAR2 (40)
6	CREATED_BY	NOT NULL	VARCHAR2 (30)
7	CREATED_DATE	NOT NULL	DATE
8	MODIFIED_BY	NULL	VARCHAR2 (30)
9	MODIFIED_DATE	NULL	DATE
10	PL_PERMIT_LICENSE_NUMBER	NOT NULL	VARCHAR2 (10)
11	PL_TYPE_TYPE	NOT NULL	VARCHAR2 (20)
12	PL_PAR_SSN_EIN	NOT NULL	NUMBER (11)
13	STATE	NULL	CHAR (2)
14	GEAR	NULL	VARCHAR2 (15)
15	LOCATION	NULL	VARCHAR2 (20)
16	START_DATE	NULL	DATE
17	END_DATE	NULL	DATE
18	PROTECTED	NULL	CHAR (1)
19	CTG_TYPE	NOT NULL	VARCHAR2 (10)

Primary Key

Name	Column
CTG_PK	CODE
	CREATED_DATE

Table Name : CATEGORIES Alias :CTG

Display Title : Categories

Object Type:
Comment :

Foreign Keys

CTG_MA_FK

MA_ID references MANAGEMENT_AREAS.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

CTG_PL_FK

PL_PERMIT_LICENSE_NUMBER references
PERMIT_LICENSES.PERMIT_LICENSE_NUMBER
PL_TYPE_TYPE references PERMIT_LICENSES.TYPE_TYPE
PL_CREATED_DATE references PERMIT_LICENSES.CREATED_DATE
PL_PAR_SSN_EIN references PERMIT_LICENSES.PAR_SSN_EIN
PL_PAR_CREATED_DATE references PERMIT_LICENSES.PAR_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----MA_FK_I	----	------	N---------
CTG_PL_FK_I	1	PL_PERMIT_LICENSE_NUMBER	NOT UNIQUE
CTG_PL_FK_I	2	PL_TYPE_TYPE	NOT UNIQUE
CTG_PL_FK_I	3	PL_CREATED_DATE	NOT UNIQUE
CTG_PL_FK_I	4	PL_PAR_SSN_EIN	NOT UNIQUE
CTG_PL_FK_I	5	PL_PAR_CREATED_DATE	NOT UNIQUE

Table Name : CONFIGURATION Alias :CONF

Display Title : Configuration

Object Type:
Comment :

Description : The data necessary to configure parts of the system for a specific participant. The primary key will be a unique number generated by an Oracle sequence.

Notes : This entity will contain data related to the overall configuration of the system for an area/region. The primary key will be a unique number generated from an Oracle sequence.

User/Help Text :The data necessary to configure parts of the system for a specific participant. The primary key will be a unique number generated by an Oracle sequence.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	TIMESTAMP_OFFSET	NOT NULL	NUMBER (4, 1)
3	BASELINE_ID	NULL	VARCHAR2 (10)
4	PERMIT_AMOUNT	NULL	NUMBER (6)
5	RECORD_RETENTION_PERIOD	NULL	NUMBER (3)

Primary Key

Name	Column
CONF_PK	ID

Table Name : CONSUMABLE_ITEMS Alias :CI

Display Title : Consumable Items

Object Type:
Comment :

Description : The consumable items used during a trip. This could be used to calculate overall CPUE.

Notes : This entity will contain data related to the consumable items used during a trip. This data will be entered by the fisherman. He will be able to pick from a pre configured initial list. He will also be able to create his own consumables. These will be combined with the original list for use in subsequent selections. The primary key for this entity will be a combination of the primary key from the trip entity and the type of consumable selected.

User/Help Text :The consumable items used during a trip. This could be used to calculate overall CPUE.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	VARCHAR2 (12)
2	CT_TYPE_TYPE	NOT NULL	VARCHAR2 (12)
3	CT_TRI_VES_HID	NOT NULL	VARCHAR2 (12)
4	CT_TRI_VES_CREATED_DATE	NOT NULL	DATE
5	DESCRIPTION	NOT NULL	VARCHAR2 (30)
6	COST	NOT NULL	NUMBER (7, 0)
7	QUANTITY	NOT NULL	NUMBER (4)
8	QUANTITY_UM	NULL	VARCHAR2 (2)
9	CT_TRI_CREATED_DATE	NOT NULL	DATE
10	CT_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
11	CREATED_BY	NOT NULL	VARCHAR2 (30)
12	CREATED_DATE	NOT NULL	DATE
13	MODIFIED_BY	NULL	VARCHAR2 (30)

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Table Name : CONSUMABLE_ITEMS Alias :CI

Display Title : Consumable Items

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
14	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
CI_PK	ID
	CT_TYPE_TYPE
	CT_TRI_CREATED_DATE
	CT_TRI_TRIP_NUMBER
	CT_TRI_VES_HID
	CT_TRI_VES_CREATED_DATE

Foreign Keys

CI_CT_FK

CT_TYPE_TYPE references CONSUMABLE_TYPES.TYPE_TYPE
CT_TRI_CREATED_DATE references CONSUMABLE_TYPES.TRI_CREATED_DATE
CT_TRI_TRIP_NUMBER references CONSUMABLE_TYPES.TRI_TRIP_NUMBER
CT_TRI_VES_HID references CONSUMABLE_TYPES.TRI_VES_HID
CT_TRI_VES_CREATED_DATE references
CONSUMABLE_TYPES.TRI_VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----T_FK_I	----	------E_TYPE	N---------
CI_CT_FK_I	2	CT_TRI_CREATED_DATE	NOT UNIQUE
CI_CT_FK_I	3	CT_TRI_TRIP_NUMBER	NOT UNIQUE
CI_CT_FK_I	4	CT_TRI_VES_HID	NOT UNIQUE
CI_CT_FK_I	5	CT_TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : CONSUMABLE_TYPES Alias :CT

Display Title : Consumable Types

Object Type:
Comment :

Description : The consumable types used during a trip. This could be used to calculate overall CPUE.

Notes : This entity will contain data related to the consumable types used during a trip. This data will be entered by the fisherman. He will be able to pick from a pre configured initial list. He will also be able to create his own consumable types. These will be combined with the original list for use in subsequent selections. The primary key for this entity will be a combination of the primary key from the trip entity and the type of consumable selected.

User/Help Text :The consumable types used during a trip. This could be used to calculate overall CPUE.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	TYPE_TYPE	NOT NULL	VARCHAR2 (12)
2	CREATED_BY	NOT NULL	VARCHAR2 (30)
3	CREATED_DATE	NOT NULL	DATE
4	MODIFIED_BY	NULL	VARCHAR2 (30)
5	MODIFIED_DATE	NULL	DATE
6	TRI_CREATED_DATE	NOT NULL	DATE
7	TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
8	TRI_VES_HID	NOT NULL	VARCHAR2 (12)
9	TRI_VES_CREATED_DATE	NOT NULL	DATE

Primary Key

Name	Column
CT_PK	TYPE_TYPE
	TRI_CREATED_DATE
	TRI_TRIP_NUMBER

Table Name : CONSUMABLE_TYPES Alias :CT

Display Title : Consumable Types

Object Type:
Comment :

Name	Column
	TRI_VES_HID
	TRI_VES_CREATED_DATE

Foreign Keys

CT_TRI_FK

TRI_CREATED_DATE references TRIPS.CREATED_DATE
TRI_TRIP_NUMBER references TRIPS.TRIP_NUMBER
TRI_VES_HID references TRIPS.VES_HID
TRI_VES_CREATED_DATE references TRIPS.VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----RI_FK_I	----	------EATED_DATE	N---------
CT_TRI_FK_I	2	TRI_TRIP_NUMBER	NOT UNIQUE
CT_TRI_FK_I	3	TRI_VES_HID	NOT UNIQUE
CT_TRI_FK_I	4	TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : ENVIRONMENTAL_SENSORS Alias :ES

Display Title : Environmental Sensors

Object Type:

Comment :

Description : The data related to the environmental sensor equipment installed on the vessel.

Notes : This entity will contain data related to the environmental sensors used during a trip. This data represents the sensors installed. The primary key for this entity will be a combination of the primary key from the fishing activity and a unique number generated from an Oracle sequence.

User/Help Text :The data related to the environmental sensor equipment installed on the vessel.

Volumes

Start Rows : End Rows :

Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	SENSOR_TYPE	NOT NULL	VARCHAR2 (8)
3	SAMPLE_METHOD	NOT NULL	CHAR (1)
4	SAMPLE_FREQUENCY	NOT NULL	VARCHAR2 (4)
5	CREATED_BY	NOT NULL	VARCHAR2 (30)
6	CREATED_DATE	NOT NULL	DATE
7	MODIFIED_BY	NULL	VARCHAR2 (30)
8	MODIFIED_DATE	NULL	DATE
9	FA_CREATED_DATE	NOT NULL	DATE
10	FA_ACTIVITY_START	NOT NULL	DATE
11	FA_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
12	FA_TRI_CREATED_DATE	NOT NULL	DATE
13	FA_TRI_VES_CREATED_DATE	NOT NULL	DATE
14	FA_TRI_VES_HID	NOT NULL	VARCHAR2 (12)

Table Name : ENVIRONMENTAL_SENSORS Alias :ES

Display Title : Environmental Sensors

Object Type:

Comment :

Primary Key

Name	Column
ES_PK	SENSOR_TYPE
	ID
	CREATED_DATE
	FA_ACTIVITY_START
	FA_CREATED_DATE
	FA_TRI_CREATED_DATE
	FA_TRI_TRIP_NUMBER
	FA_TRI_VES_HID
	FA_TRI_VES_CREATED_DATE

Index Summary

Name	Seq.	Column	Index Type
----A_FK_I	----	------IVITY_START	N---------
ES_FA_FK_I	2	FA_CREATED_DATE	NOT UNIQUE
ES_FA_FK_I	3	FA_TRI_CREATED_DATE	NOT UNIQUE
ES_FA_FK_I	4	FA_TRI_TRIP_NUMBER	NOT UNIQUE
ES_FA_FK_I	5	FA_TRI_VES_HID	NOT UNIQUE
ES_FA_FK_I	6	FA_TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : EVENTS Alias :EVT

Display Title : Events

Object Type:
Comment :

Description : This entity contains events that occur during a fishing activity

Notes : This represents the events that can occur during a fishing activity. These events will be regionally configurable to allow for the greatest flexibility in the system.

User/Help Text :This entity contains events that occur during a fishing activity

Volumes

Start Rows : 100 End Rows : 5000
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	GC_ID	NOT NULL	NUMBER (10)
2	EVENT_ID	NOT NULL	NUMBER (10)
3	NAME	NOT NULL	VARCHAR2 (40)

Primary Key

Name	Column
EVT_PK	EVENT_ID

Foreign Keys

EVT_GC_FK

GC_ID references GEAR_CATEGORIES.ID
Transferable ? Yes Update Rule : Restricted
Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----GC_FK_I	----	------	N---------

Table Name : FISHING_ACTIVITIES Alias :FA

Display Title : Fishing Activities

Object Type:
Comment :

Description : A specific fishing activity. A fishing activity consists of a starting time and location and an ending time and location. In the case of a tow the start is determined when the net winches are locked in place. The end of the tow is when the net starts to be hauled back in.

Notes : This entity will contain data related to the fishing activity/ tow. The primary key for this record will be a combination of the Trip primary key and a unique number generate from an Oracle sequence.

User/Help Text :A specific fishing activity. A fishing activity consists of a starting time and location and an ending time and location. In the case of a tow the start is determined when the net winches are locked in place. The end of the tow is when the net starts to be hauled back in.

Volumes

Start Rows : 0 End Rows : 200000
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ACTIVITY_START	NOT NULL	DATE
2	ACTIVITY_END	NOT NULL	DATE
3	TARGET_STRATEGY	NOT NULL	CHAR (4)
4	DEPTH	NOT NULL	NUMBER (5)
5	DEPTH_UM	NOT NULL	VARCHAR2 (2)
6	ONBOARD_PROCESS_TIME	NULL	NUMBER ()
7	SPEED	NULL	NUMBER (3)
8	COURSE	NULL	VARCHAR2 (8)
9	FUEL_CONSUMPTION	NULL	NUMBER (5, 0)
10	CAUTIONS	NULL	VARCHAR2 (15)
11	WEATHER	NULL	VARCHAR2 (10)
12	WIND_SPEED	NULL	NUMBER (3)

Table Name : FISHING_ACTIVITIES Alias :FA

Display Title : Fishing Activities

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
13	WIND_SPEED_UM	NULL	VARCHAR2 (2)
14	WIND_DIRECTION	NULL	VARCHAR2 (3)
15	WAVE_HEIGHT	NULL	NUMBER (2)
16	WAVE_HEIGHT_UM	NULL	CHAR (3)
17	DEPTH_RANGE_BOTTON	NULL	NUMBER (4)
18	TEMPATURE	NULL	NUMBER (3)
19	TEMPATURE_UM	NULL	CHAR (1)
20	NOTES	NULL	VARCHAR2 (250)
21	SPATIAL_OBJECT_ICON	NULL	LONG RAW ()
22	CREATED_BY	NOT NULL	VARCHAR2 (30)
23	CREATED_DATE	NOT NULL	DATE
24	MODIFIED_BY	NULL	VARCHAR2 (30)
25	MODIFIED_DATE	NULL	DATE
26	TRI_CREATED_DATE	NOT NULL	DATE
27	TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
28	TRI_VES_HID	NOT NULL	VARCHAR2 (12)
29	TRI_VES_CREATED_DATE	NOT NULL	DATE
30	GA_ID	NOT NULL	NUMBER (10)
31	GA_GEC_ID	NOT NULL	NUMBER (10)
32	GA_GEC_GC_ID	NOT NULL	NUMBER (10)

Primary Key

Name	Column
FA_PK	ACTIVITY_START CREATED_DATE TRI_CREATED_DATE

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Table Name : FISHING_ACTIVITIES Alias :FA

Display Title : Fishing Activities

Object Type:
Comment :

Name	Column
	TRI_TRIP_NUMBER
	TRI_VES_HID
	TRI_VES_CREATED_DATE

Foreign Keys

FA_GA_FK

GA_ID references GEAR_ALIASES.ID
GA_GEC_ID references GEAR_ALIASES.GEC_ID
GA_GEC_GC_ID references GEAR_ALIASES.GEC_GC_ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

FA_TRI_FK

TRI_CREATED_DATE references TRIPS.CREATED_DATE
TRI_TRIP_NUMBER references TRIPS.TRIP_NUMBER
TRI_VES_HID references TRIPS.VES_HID
TRI_VES_CREATED_DATE references TRIPS.VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----A_FK_I	----	------	N---------
FA_GA_FK_I	2	GA_GEC_ID	NOT UNIQUE
FA_GA_FK_I	3	GA_GEC_GC_ID	NOT UNIQUE
FA_TRI_FK_I	1	TRI_CREATED_DATE	NOT UNIQUE
FA_TRI_FK_I	2	TRI_TRIP_NUMBER	NOT UNIQUE
FA_TRI_FK_I	3	TRI_VES_HID	NOT UNIQUE
FA_TRI_FK_I	4	TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : FISHING_ACT_GEAR_VALS Alias :FAGV

Display Title : Fishing Act Gear Vals

Object Type:

Comment :

Description : This is the combination of gear values and fishing activities

Notes : This represents the gear values that are used during a specific fishing activity.

User/Help Text :This is the combination of gear values and fishing activities

Volumes

Start Rows : 0 End Rows : 0

Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	FA_ACTIVITY_START	NOT NULL	DATE
2	FA_CREATED_DATE	NOT NULL	DATE
3	FA_TRI_CREATED_DATE	NOT NULL	DATE
4	FA_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
5	FA_TRI_VES_HID	NOT NULL	VARCHAR2 (12)
6	FA_TRI_VES_CREATED_DATE	NOT NULL	DATE
7	GV_ID	NOT NULL	NUMBER (10)
8	GV_GEC_ID	NOT NULL	NUMBER (10)
9	GV_GEC_GC_ID	NOT NULL	NUMBER (10)

Primary Key

Name	Column
FAGV_PK	GV_ID
	GV_GEC_ID
	GV_GEC_GC_ID
	FA_ACTIVITY_START
	FA_CREATED_DATE
	FA_TRI_CREATED_DATE
	FA_TRI_TRIP_NUMBER
	FA_TRI_VES_HID
	FA_TRI_VES_CREATED_DATE

Table Name : FISHING_ACT_GEAR_VALS Alias :FAGV

Display Title : Fishing Act Gear Vals

Object Type:

Comment :

Foreign Keys

FAGV_FA_FK

FA_ACTIVITY_START references FISHING_ACTIVITIES.ACTIVITY_START
FA_CREATED_DATE references FISHING_ACTIVITIES.CREATED_DATE
FA_TRI_CREATED_DATE references FISHING_ACTIVITIES.TRI_CREATED_DATE
FA_TRI_TRIP_NUMBER references FISHING_ACTIVITIES.TRI_TRIP_NUMBER
FA_TRI_VES_HID references FISHING_ACTIVITIES.TRI_VES_HID
FA_TRI_VES_CREATED_DATE references FISHING_ACTIVITIES.TRI_VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

FAGV_GV_FK

GV_ID references GEAR_VALUES.ID
GV_GEC_ID references GEAR_VALUES.GEC_ID
GV_GEC_GC_ID references GEAR_VALUES.GEC_GC_ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----_FA_FK_I	----	------IVITY_START	N---------
FAGV_FA_FK_I	2	FA_CREATED_DATE	NOT UNIQUE
FAGV_FA_FK_I	3	FA_TRI_CREATED_DATE	NOT UNIQUE
FAGV_FA_FK_I	4	FA_TRI_TRIP_NUMBER	NOT UNIQUE
FAGV_FA_FK_I	5	FA_TRI_VES_HID	NOT UNIQUE
FAGV_FA_FK_I	6	FA_TRI_VES_CREATED_DATE	NOT UNIQUE
FAGV_GV_FK_I	1	GV_ID	NOT UNIQUE
FAGV_GV_FK_I	2	GV_GEC_ID	NOT UNIQUE
FAGV_GV_FK_I	3	GV_GEC_GC_ID	NOT UNIQUE

Table Name : FISHING_ACT_LOCS Alias :FAL

Display Title : Fishing Act Locs

Object Type:
Comment :

Description : The Longitude and Latitude points for a vessel at any given point intime during a trip..

Notes : This entity will contain data for the fishing activity locations during a trip. This data will be generated as a result of the GPS device installed on the vessel. The data will be downloaded into the database and matched up with a vessel and trip. The primary key for this entity will be a combination of the primary key from the fishing activity and a unique number. The number will be obtained from an Oracle sequence.

User/Help Text :The Longitude and Latitude points for a vessel at any given point in time during a trip.

Volumes

Start Rows : 0 End Rows : 1000000
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	TIMESTAMP	NOT NULL	DATE
2	LATITUDE	NOT NULL	NUMBER (8, 5)
3	LONGITUDE	NOT NULL	NUMBER (9, 5)
4	EVENT_ID	NULL	NUMBER (10)
5	EVT_EVENT_ID	NULL	NUMBER (10)
6	FA_ACTIVITY_STATHE_LOCATION_OF	NOT NULL	DATE
7	FA_CREATED_DATETHE_LOCATION_OF	NOT NULL	DATE
8	FA_TRI_CREATED_THE_LOCATION_OF	NOT NULL	DATE
9	FA_TRI_TRIP_NUMTHE_LOCATION_OF	NOT NULL	NUMBER (10)
10	FA_TRI_VES_HID_THE_LOCATION_OF	NOT NULL	VARCHAR2 (12)
11	FA_TRI_VES_CREATHE_LOCATION_OF	NOT NULL	DATE
12	FA_ACTIVITY_START	NOT NULL	DATE
13	FA_CREATED_DATE	NOT NULL	DATE

Table Name : FISHING_ACT_LOCS Alias :FAL

Display Title : Fishing Act Locs

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
14	FA_TRI_VES_CREATED_DATE	NOT NULL	DATE
15	FA_TRI_CREATED_DATE	NOT NULL	DATE
16	FA_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
17	FA_TRI_VES_HID	NOT NULL	VARCHAR2 (12)

Primary Key

Name	Column
FAL_PK	TIMESTAMP
	FA_ACTIVITY_START
	FA_ACTIVITY_STATHE_LOCATION_OF
	FA_CREATED_DATE
	FA_CREATED_DATETHE_LOCATION_OF
	FA_TRI_CREATED_DATE
	FA_TRI_CREATED_THE_LOCATION_OF
	FA_TRI_TRIP_NUMBER
	FA_TRI_TRIP_NUMTHE_LOCATION_OF
	FA_TRI_VES_HID
	FA_TRI_VES_HID_THE_LOCATION_OF
	FA_TRI_VES_CREATED_DATE
	FA_TRI_VES_CREATHE_LOCATION_OF

Table Name : FISHING_ACT_LOCS Alias :FAL

Display Title : Fishing Act Locs

Object Type:
Comment :

Foreign Keys

FAL_EVT_FK

EVT_EVENT_ID references EVENTS.EVENT_ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? No Delete Rule : Restricted

FAL_FA_FK

FA_ACTIVITY_STATHE_LOCATION_OF references
FISHING_ACTIVITIES.ACTIVITY_START
FA_CREATED_DATETHE_LOCATION_OF references
FISHING_ACTIVITIES.CREATED_DATE
FA_TRI_CREATED_THE_LOCATION_OF references
FISHING_ACTIVITIES.TRI_CREATED_DATE
FA_TRI_TRIP_NUMTHE_LOCATION_OF references
FISHING_ACTIVITIES.TRI_TRIP_NUMBER
FA_TRI_VES_HID_THE_LOCATION_OF references
FISHING_ACTIVITIES.TRI_VES_HID
FA_TRI_VES_CREATHE_LOCATION_OF references
FISHING_ACTIVITIES.TRI_VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Table Name : FISHING_ACT_LOCS Alias :FAL

Display Title : Fishing Act Locs

Object Type:
Comment :

Index Summary

Name	Seq.	Column	Index Type
----EVT_FK_I	----	------ENT_ID	N---------
FAL_FA_FK_I	1	FA_ACTIVITY_START	NOT UNIQUE
FAL_FA_FK_I	2	FA_CREATED_DATE	NOT UNIQUE
FAL_FA_FK_I	3	FA_TRI_CREATED_DATE	NOT UNIQUE
FAL_FA_FK_I	4	FA_TRI_TRIP_NUMBER	NOT UNIQUE
FAL_FA_FK_I	5	FA_TRI_VES_HID	NOT UNIQUE
FAL_FA_FK_I	6	FA_TRI_VES_CREATED_DATE	NOT UNIQUE
FAL_FA_FK_I_1	1	FA_ACTIVITY_STATHE_LOCATIONOF	NOT UNIQUE
FAL_FA_FK_I_1	2	FA_CREATED_DATETHE_LOCATIONOF	NOT UNIQUE
FAL_FA_FK_I_1	3	FA_TRI_CREATED_THE_LOCATIONOF	NOT UNIQUE
FAL_FA_FK_I_1	4	FA_TRI_TRIP_NUMTHE_LOCATIONOF	NOT UNIQUE
FAL_FA_FK_I_1	5	FA_TRI_VES_HID_THE_LOCATIONOF	NOT UNIQUE
FAL_FA_FK_I_1	6	FA_TRI_VES_CREATHE_LOCATIONOF	NOT UNIQUE

Table Name : GEAR_ALIASES Alias :GA

Display Title : Gear Aliases

Object Type:
Comment :

Description : This represents the name given, by a fisher, to a specific configuration of gear values.
User/Help Text :This represents the name given, by a fisher, to a specific configuration of gear values.

Volumes

Start Rows : 0 End Rows : 40000
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	NAME	NOT NULL	VARCHAR2 (40)
3	CREATED_BY	NOT NULL	VARCHAR2 (30)
4	CREATED_DATE	NOT NULL	DATE
5	MODIFIED_BY	NULL	VARCHAR2 (30)
6	MODIFIED_DATE	NULL	DATE
7	GEC_ID	NOT NULL	NUMBER (10)
8	GEC_GC_ID	NOT NULL	NUMBER (10)

Primary Key

Name	Column
GA_PK	ID
	GEC_ID
	GEC_GC_ID

Foreign Keys

GA_GEC_FK

GEC_ID references GEAR_CHARACTERISTICS.ID
GEC_GC_ID references GEAR_CHARACTERISTICS.GC_ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Table Name : GEAR_ALIASES Alias :GA

Display Title : Gear Aliases

Object Type:
Comment :

Index Summary

Name	Seq.	Column	Index Type
----EC_FK_I	----	------	N---------
GA_GEC_FK_I	2	GEC_GC_ID	NOT UNIQUE

Table Name : GEAR_CATEGORIES Alias :GC

Display Title : Gear Categories

Object Type:
Comment :

Description : A specific category of gear used in fishing. It might be a net used for towing, pots for crab or shrimp, or a longline soak. Gear is unique to an individual fishing activity.

Notes : This entity will contain the data related to the types of gear that could be used during a fishing activity. The data will be presented to the user in the form of a pick list. This pick list will be regionally configurable. Additions will be allowed with the proper authority.

User/Help Text :A specific category of gear used in fishing. It might be a net used for towing, pots for crab or shrimp, or a longline soak. Gear is unique to an individual fishing activity.

Volumes

Start Rows : 20 End Rows : 2000
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	TYPE_TYPE	NOT NULL	VARCHAR2 (15)
3	CREATED_BY	NOT NULL	VARCHAR2 (30)
4	CREATED_DATE	NOT NULL	DATE
5	MODIFIED_BY	NULL	VARCHAR2 (30)
6	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
GC_PK	ID

Table Name : GEAR_CHARACTERISTICS Alias :GEC

Display Title : Gear Characteristics
Object Type:
Comment :

Description : A specific type of gear. The fisherman might want to test out various configurations of characteristics. This will allow for the capture of these settings. In addition the catches from these settings can be compared with other catches with similar configurations.

Notes : This entity will contain the data related to Gear Characteristics. The characteristics will be selected by the fisherman and are related to the Gear Category entity. The fisherman can select as many or as few characteristics as he feels necessary. This will allow for multiple configuration for the same Gear Category. The primary key for this record will be a combination of the primary key from Gear Category and a unique number generated by an Oracle Sequence.

User/Help Text :A specific type of gear. The fisherman might want to test out various configurations of characteristics. This will allow for the capture of these settings. In addition the catches from these settings can be compared with other catches with similar configurations.

Volumes

Start Rows : 600 End Rows : 200000
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	NAME	NOT NULL	VARCHAR2 (30)
3	HIGH_VALUE	NOT NULL	VARCHAR2 (20)
4	LOW_VALUE	NOT NULL	VARCHAR2 (20)
5	DEFAULT_VALUE	NOT NULL	VARCHAR2 (20)
6	REQUIRED	NOT NULL	CHAR (1)
7	GC_ID	NOT NULL	NUMBER (10)
8	CREATED_BY	NOT NULL	VARCHAR2 (30)
9	CREATED_DATE	NOT NULL	DATE
10	MODIFIED_BY	NULL	VARCHAR2 (30)

Table Name : GEAR_CHARACTERISTICS Alias :GEC

Display Title : Gear Characteristics
Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
11	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
GEC_PK	ID
	GC_ID

Foreign Keys

GEC_GC_FK

GC_ID references GEAR_CATEGORIES.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----GC_FK_I	----	------	N---------

Table Name : GEAR_VALUES Alias :GV

Display Title : Gear Values

Object Type:
Comment :

Description : A specific set of characteristics for a type of gear. The fisherman might want to test out various configurations of characteristics. This will allow for the capture of these settings. In addition the catches from these settings can be compared with other catches with similar configurations.

Notes : This entity will contain the data related to Gear Values. The values will be entered by the fisherman and are related to the Gear Characteristic entity. The fisherman can enter and many or as few values as he feels necessary. This will allow for multiple configuration for the same Gear Category.

User/Help Text :A specific set of characteristics for a type of gear. The fisherman might want to test out various configurations of characteristics. This will allow for the capture of these settings. In addition the catches from these settings can be compared with other catches with similar configurations.

Volumes

Start Rows : 0 End Rows : 90000
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	VALUE	NOT NULL	VARCHAR2 (20)
3	VALUE_UNITS	NOT NULL	VARCHAR2 (5)
4	CREATED_BY	NOT NULL	VARCHAR2 (30)
5	CREATED_DATE	NOT NULL	DATE
6	MODIFIED_BY	NULL	VARCHAR2 (30)
7	MODIFIED_DATE	NULL	DATE
8	GEC_ID	NOT NULL	NUMBER (10)
9	GEC_GC_ID	NOT NULL	NUMBER (10)
10	GA_ID	NOT NULL	NUMBER (10)
11	GA_GEC_ID	NOT NULL	NUMBER (10)

Table Name : GEAR_VALUES Alias :GV

Display Title : Gear Values

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
12	GA_GEC_GC_ID	NOT NULL	NUMBER (10)

Primary Key

Name	Column
GV_PK	ID
	GEC_ID
	GEC_GC_ID

Foreign Keys

GV_GA_FK

GA_ID references GEAR_ALIASES.ID
GA_GEC_ID references GEAR_ALIASES.GEC_ID
GA_GEC_GC_ID references GEAR_ALIASES.GEC_GC_ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

GV_GEC_FK

GEC_ID references GEAR_CHARACTERISTICS.ID
GEC_GC_ID references GEAR_CHARACTERISTICS.GC_ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----A_FK_I	----	------	N---------
GV_GA_FK_I	2	GA_GEC_ID	NOT UNIQUE
GV_GA_FK_I	3	GA_GEC_GC_ID	NOT UNIQUE
GV_GEC_FK_I	1	GEC_ID	NOT UNIQUE
GV_GEC_FK_I	2	GEC_GC_ID	NOT UNIQUE

Table Name : ISSUING_AUTHORITIES Alias :IA

Display Title : Issuing Authorities
Object Type:
Comment :

Description : The Government Agency, either Federal, State, or Local, that issued the permit or license.

Notes : This entity will contain data related to the Issuing Authority for permits and licenses. The primary key for this record will be unique number generated from an Oracle sequence.

User/Help Text :The Government Agency, either Federal, State, or Local, that issued the permit or license.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	AGENCY_CODE	NOT NULL	VARCHAR2 (6)
3	NAME	NOT NULL	VARCHAR2 (40)
4	ADDRESS_1	NOT NULL	VARCHAR2 (30)
5	ADDRESS_2	NULL	VARCHAR2 (30)
6	CITY	NOT NULL	VARCHAR2 (25)
7	STATE_PROVINCE	NOT NULL	CHAR (2)
8	ZIP_CODE_POSTAL_CODE	NOT NULL	VARCHAR2 (13)
9	PHONE_NUMBER	NOT NULL	VARCHAR2 (12)
10	FAX_NUMBER	NULL	VARCHAR2 (12)
11	CONTACT_NAME	NULL	VARCHAR2 (40)
12	CONTACT_PHONE	NULL	VARCHAR2 (12)
13	CONTACT_EMAIL	NULL	VARCHAR2 (40)
14	CREATED_BY	NOT NULL	VARCHAR2 (30)
15	CREATED_DATE	NOT NULL	DATE

Table Name : ISSUING_AUTHORITIES Alias :IA

Display Title : Issuing Authorities
Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
16	MODIFIED_BY	NULL	VARCHAR2 (30)
17	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
IA_PK	ID

Table Name : LANDINGS Alias :LAN

Display Title : Landings

Object Type:
Comment :

Description : The fish caught during a trip that are being sold to a dealer/processor.

Notes : This entity will contain the data related to the landing of fish from a trip. This is the general information specific to a landing. The primary key for this record is the fish ticket number.

If the landing occurs within Oregon a new record will be generated each time a new gear type is encountered.

User/Help Text :The fish caught during a trip that are being sold to a dealer/processor.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	FISH_TICKET_NUMBER	NOT NULL	NUMBER (9)
2	FISH_TICKET_TYPE	NOT NULL	CHAR (1)
3	LANDED_DATE	NOT NULL	DATE
4	LOCATION_CAUGHT	NOT NULL	VARCHAR2 (6)
5	DEDUCTIONS	NULL	NUMBER (9, 2)
6	CREATED_BY	NOT NULL	VARCHAR2 (30)
7	PAR_SSN_EIN	NOT NULL	NUMBER (11)
8	PAR_CREATED_DATE	NOT NULL	DATE
9	TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
10	TRI_CREATED_DATE	NOT NULL	DATE
11	CREATED_DATE	NOT NULL	DATE
12	MODIFIED_BY	NULL	VARCHAR2 (30)
13	MODIFIED_DATE	NULL	DATE

Table Name : LANDINGS Alias :LAN

Display Title : Landings

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
14	POR_ID	NOT NULL	NUMBER (10)
15	TRI_VES_CREATED_DATE	NOT NULL	DATE
16	TRI_VES_HID	NOT NULL	VARCHAR2 (12)

Primary Key

Name	Column
LAN_PK	FISH_TICKET_NUMBER
	CREATED_DATE
	TRI_CREATED_DATE
	TRI_TRIP_NUMBER
	TRI_VES_HID
	TRI_VES_CREATED_DATE
	PAR_SSN_EIN
	PAR_CREATED_DATE

Foreign Keys

LAN_PAR_FK

PAR_SSN_EIN references PARTICIPANTS.SSN_EIN
PAR_CREATED_DATE references PARTICIPANTS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

LAN_POR_FK

POR_ID references PORTS.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

LAN_TRI_FK

TRI_CREATED_DATE references TRIPS.CREATED_DATE
TRI_TRIP_NUMBER references TRIPS.TRIP_NUMBER
TRI_VES_HID references TRIPS.VES_HID
TRI_VES_CREATED_DATE references TRIPS.VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Table Name : LANDINGS Alias :LAN

Display Title : Landings

Object Type:
Comment :

Index Summary

Name	Seq.	Column	Index Type
----PAR_FK_I	----	------N_EIN	N---------
LAN_PAR_FK_I	2	PAR_CREATED_DATE	NOT UNIQUE
LAN_POR_FK_I	1	POR_ID	NOT UNIQUE
LAN_TRI_FK_I	1	TRI_CREATED_DATE	NOT UNIQUE
LAN_TRI_FK_I	2	TRI_TRIP_NUMBER	NOT UNIQUE
LAN_TRI_FK_I	3	TRI_VES_HID	NOT UNIQUE
LAN_TRI_FK_I	4	TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : LANDING_DETAILS Alias :LD

Display Title : Landing Details

Object Type:
Comment :

Description : The detail lines on a fish ticket. These lines will contain the species of fish landed, the number of pounds landed and any other pertinent information.

Notes : This entity contains the data related to the individual lines on the fish ticket. The primary key for this record is a combination of the primary key from the Landing entity and a sequential number starting at 1 incrementing by 1 for each unique species of fish.

User/Help Text :The detail lines on a fish ticket. These lines will contain the species of fish landed, the number of pounds landed and any other pertinent information.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	LAN_TRI_CREATED_DATE	NOT NULL	DATE
2	LAN_TRI_VES_CREATED_DATE	NOT NULL	DATE
3	LAN_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
4	LAN_TRI_VES_HID	NOT NULL	VARCHAR2 (12)
5	LAN_PAR_SSN_EIN	NOT NULL	NUMBER (11)
6	LAN_PAR_CREATED_DATE	NOT NULL	DATE
7	LINE_NUMBER	NOT NULL	NUMBER (2, 0)
8	WEIGHT_LANDED	NOT NULL	NUMBER (6)
9	WEIGHT_UM	NOT NULL	CHAR (1)
10	CONDITION	NULL	CHAR (2)
11	GEAR_CATEGORY	NULL	VARCHAR2 (15)
12	SIZE_SIZE	NULL	CHAR (1)
13	UNIT_PRICE	NULL	NUMBER (6, 2)

Table Name : LANDING_DETAILS Alias :LD

Display Title : Landing Details

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
14	WEIGH_BACK	NULL	NUMBER (6, 0)
15	TAKE_HOME	NULL	NUMBER (3)
16	CREATED_BY	NOT NULL	VARCHAR2 (30)
17	CREATED_DATE	NOT NULL	DATE
18	LAN_FISH_TICKET_NUMBER	NOT NULL	NUMBER (9)
19	LAN_CREATED_DATE	NOT NULL	DATE
20	MODIFIED_BY	NULL	VARCHAR2 (30)
21	MODIFIED_DATE	NULL	DATE
22	CTG_CODE	NOT NULL	VARCHAR2 (4)
23	CTG_CREATED_DATE	NOT NULL	DATE

Primary Key

Name	Column
LD_PK	LINE_NUMBER
	CREATED_DATE
	CTG_CODE
	CTG_CREATED_DATE
	LAN_FISH_TICKET_NUMBER
	LAN_CREATED_DATE
	LAN_TRI_CREATED_DATE
	LAN_TRI_TRIP_NUMBER
	LAN_TRI_VES_HID
	LAN_TRI_VES_CREATED_DATE
	LAN_PAR_SSN_EIN
	LAN_PAR_CREATED_DATE

Table Name : LANDING_DETAILS Alias :LD

Display Title : Landing Details

Object Type:
Comment :

Foreign Keys

LD_CTG_FK

CTG_CODE references CATEGORIES.CODE
CTG_CREATED_DATE references CATEGORIES.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

LD_LAN_FK

LAN_FISH_TICKET_NUMBER references LANDINGS.FISH_TICKET_NUMBER
LAN_CREATED_DATE references LANDINGS.CREATED_DATE
LAN_TRI_CREATED_DATE references LANDINGS.TRI_CREATED_DATE
LAN_TRI_TRIP_NUMBER references LANDINGS.TRI_TRIP_NUMBER
LAN_TRI_VES_HID references LANDINGS.TRI_VES_HID
LAN_TRI_VES_CREATED_DATE references LANDINGS.TRI_VES_CREATED_DATE
LAN_PAR_SSN_EIN references LANDINGS.PAR_SSN_EIN
LAN_PAR_CREATED_DATE references LANDINGS.PAR_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----TG_FK_I_1	----	------DE	N---------
LD_CTG_FK_I_1	2	CTG_CREATED_DATE	NOT UNIQUE
LD_LAN_FK_I	1	LAN_FISH_TICKET_NUMBER	NOT UNIQUE
LD_LAN_FK_I	2	LAN_CREATED_DATE	NOT UNIQUE
LD_LAN_FK_I	3	LAN_TRI_CREATED_DATE	NOT UNIQUE
LD_LAN_FK_I	4	LAN_TRI_TRIP_NUMBER	NOT UNIQUE
LD_LAN_FK_I	5	LAN_TRI_VES_HID	NOT UNIQUE
LD_LAN_FK_I	6	LAN_TRI_VES_CREATED_DATE	NOT UNIQUE
LD_LAN_FK_I	7	LAN_PAR_SSN_EIN	NOT UNIQUE
LD_LAN_FK_I	8	LAN_PAR_CREATED_DATE	NOT UNIQUE

Table Name : LIMITS Alias :LIM

Display Title : Limits

Object Type:
Comment :

Description : The amount of harvestable fish that can be caught during any one fishing trip based on where the fishing was done. Management Areas have different quota amounts and if a vessel fished in two different areas then they are limited to the lessor quota amount.

Notes : This entity will contain the data related to the fish catch limits. These limits are associated with a management area and species group. The primary key for this record is a combination of the primary key from the Management Area entity, the primary key from the Species Group entity and a unique number generated from an Oracle sequence.

User/Help Text :The amount of harvestable fish that can be caught during any one fishing trip based on where the fishing was done. Management Areas have different quota amounts and if a vessel fished in two different areas then they are limited to the lessor quota amount.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	UNITS	NOT NULL	CHAR (1)
2	QS_TYPE	NULL	CHAR (3)
3	SEASONAL_MULTIPLIER	NULL	NUMBER (8, 6)
4	BEGIN_DATE	NOT NULL	DATE
5	CTG_CREATED_DATE	NOT NULL	DATE
6	ID	NOT NULL	NUMBER (10)
7	AMOUNT	NOT NULL	NUMBER (6)
8	END_DATE	NOT NULL	DATE
9	CREATED_BY	NOT NULL	VARCHAR2 (30)
10	CREATED_DATE	NOT NULL	DATE
11	MODIFIED_BY	NULL	VARCHAR2 (30)
12	MODIFIED_DATE	NULL	DATE

Table Name : LIMITS Alias :LIM

Display Title : Limits

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
13	CTG_CODE	NOT NULL	VARCHAR2 (4)

Primary Key

Name	Column
LIM_PK	ID
	CTG_CODE
	CTG_CREATED_DATE

Foreign Keys

LIM_CTG_FK

CTG_CODE references CATEGORIES.CODE
CTG_CREATED_DATE references CATEGORIES.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----CTG_FK_I	----	------DE	N---------
LIM_CTG_FK_I	2	CTG_CREATED_DATE	NOT UNIQUE

Table Name : MANAGEMENT_AREAS Alias :MA

Display Title : Management Areas

Object Type:
Comment :

Description : The region of the ocean which has been setup as a specific regulatory area. This areas are used to regulate the fishing activity within its boundaries.

Notes : This entity will contain the data related to the management areas. A management area is defined by the location of it corners. These corners are defined at specific Latitude and Longitude locations. The primary key for this record will be a unique number generated from an Oracle sequence.

User/Help Text :The region of the ocean which has been setup as a specific regulatory area. This areas are used to regulate the fishing activity within its boundaries.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	NAME	NOT NULL	VARCHAR2 (40)
3	SPATIAL_ITEM_ICON	NULL	LONG RAW ()
4	CREATED_BY	NOT NULL	VARCHAR2 (30)
5	CREATED_DATE	NOT NULL	DATE
6	MODIFIED_BY	NULL	VARCHAR2 (30)
7	MODIFIED_DATE	NULL	DATE
8	MA_ID	NULL	NUMBER (10)

Primary Key

Name	Column
MA_PK	ID

Table Name : MANAGEMENT_AREAS Alias :MA

Display Title : Management Areas

Object Type:
Comment :

Foreign Keys

MA_MA_FK

MA_ID references MANAGEMENT_AREAS.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? No Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----A_FK_I	----	------	N---------

Table Name : MANAGEMENT_AREA_BNDRS Alias :MAB

Display Title : Management Area Boundaries
Object Type:
Comment :

Description : The boundary for a management area.

The boundary locations of a management area. The corners are represented by their Longitude and Latitude coordinates. The distance from an object used to define a management area

Notes : This represents the boundary for a management area. The data stored here is used to create the spatial objects used by the Internet Map Server when displaying a map. This entity will contain the data related to the management area boundaries. These records will define the exact boundaries for each Management Area. The primary key for this record will be a combination of the Management Area primary key and a corner number.

This represents the distance from an object that will be used to define a management area.

User/Help Text :The boundary for a management area.

The boundary locations of a management area. The corners are represented by their Longitude and Latitude coordinates.

The distance from an object used to define a management area

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	CREATED_BY	NOT NULL	VARCHAR2 (30)
3	CREATED_DATE	NOT NULL	DATE
4	MODIFIED_BY	NULL	VARCHAR2 (30)
5	MODIFIED_DATE	NULL	DATE
6	MA_ID	NOT NULL	NUMBER (10)

Table Name : MANAGEMENT_AREA_BNDRS Alias :MAB

Display Title : Management Area Boundaries

Object Type:

Comment :

Col.Seq.	Column	Nulls ?	Type
7	OBJECT	NULL	VARCHAR2 (100)
8	NAME	NULL	VARCHAR2 (40)
9	AMOUNT	NULL	NUMBER (3, 0)
10	UNIT	NULL	VARCHAR2 (1)
11	POLYGON_ID	NULL	NUMBER (10)
12	CORNOR_ID	NULL	NUMBER (10)
13	LATITUDE	NULL	NUMBER (8, 5)
14	LONGITUDE	NULL	NUMBER (9, 5)
15	MAB_TYPE	NOT NULL	VARCHAR2 (10)

Primary Key

Name	Column
MAB_PK	MA_ID ID

Foreign Keys

MAB_MA_FK

MA_ID references MANAGEMENT_AREAS.ID

Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----MA_FK_I	----	------	N---------

Table Name : MARKER_LOCATIONS Alias :ML

Display Title : Marker Locations

Object Type:
Comment :

Description : This contains information about points of interest to the skipper

Notes : This represents location that are of interest to the skipper. These are recorded for a trip and will be accessible on subsequent trips.

User/Help Text :This contains information about points of interest to the skipper

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	TRI_CREATED_DATE	NOT NULL	DATE
2	TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
3	TRI_VES_CREATED_DATE	NOT NULL	DATE
4	TRI_VES_HID	NOT NULL	VARCHAR2 (12)
5	TIMESTAMP	NOT NULL	DATE
6	LATITUDE	NOT NULL	NUMBER (8, 5)
7	LONGITUDE	NOT NULL	NUMBER (9, 5)
8	NOTES	NULL	VARCHAR2 (250)

Primary Key

Name	Column
ML_PK	TIMESTAMP

Table Name : MARKER_LOCATIONS Alias :ML

Display Title : Marker Locations

Object Type:
Comment :

Foreign Keys

ML_TRI_FK

TRI_CREATED_DATE references TRIPS.CREATED_DATE
TRI_TRIP_NUMBER references TRIPS.TRIP_NUMBER
TRI_VES_HID references TRIPS.VES_HID
TRI_VES_CREATED_DATE references TRIPS.VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----RI_FK_I	----	------EATED_DATE	N---------
ML_TRI_FK_I	2	TRI_TRIP_NUMBER	NOT UNIQUE
ML_TRI_FK_I	3	TRI_VES_HID	NOT UNIQUE
ML_TRI_FK_I	4	TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : PARTICIPANTS Alias :PAR

Display Title : Participants

Object Type:
Comment :

Description : The individuals or organizations who are involved in the harvesting and processing of fish.

Notes : This entity contains the data related to a participant. Each participant will be defined by their type of participation in the system. The primary key for this record will be a unique number generated by an Oracle sequence.

User/Help Text :The individuals or organizations who are involved in the harvesting and processing of fish.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	SSN_EIN	NOT NULL	NUMBER (11)
2	CORPORATE_NAME	NULL	VARCHAR2 (40)
3	LAST_NAME	NULL	VARCHAR2 (20)
4	FIRST_NAME	NULL	VARCHAR2 (15)
5	MIDDLE_INITIAL	NULL	CHAR (1)
6	STREET_ADDRESS1	NOT NULL	VARCHAR2 (30)
7	STREET_ADDRESS2	NULL	VARCHAR2 (30)
8	CITY	NOT NULL	VARCHAR2 (25)
9	STATE_PROVINCE	NOT NULL	CHAR (2)
10	ZIP_POSTAL_CODE	NOT NULL	VARCHAR2 (13)
11	COUNTRY	NULL	VARCHAR2 (10)
12	PRIMARY_PHONE	NOT NULL	VARCHAR2 (12)
13	SECONDARY_PHONE	NULL	VARCHAR2 (12)
14	FAX_NUMBER	NULL	VARCHAR2 (12)

Table Name : PARTICIPANTS Alias :PAR

Display Title : Participants

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
15	EMAIL_ADDRESS	NULL	VARCHAR2 (40)
16	CREATED_BY	NOT NULL	VARCHAR2 (30)
17	CREATED_DATE	NOT NULL	DATE
18	MODIFIED_BY	NULL	VARCHAR2 (30)
19	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
PAR_PK	SSN_EIN
	CREATED_DATE

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Table Name : PARTICIPANT_PORTS Alias :PP

Display Title : Participant Ports

Object Type:
Comment :

Description : This represents the location that a participant is located at or works out of.
User/Help Text :This represents the location that a participant is located at or works out of.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	PAR_CREATED_DATE	NOT NULL	DATE
2	PAR_SSN_EIN	NOT NULL	NUMBER (11)
3	POR_ID	NOT NULL	NUMBER (10)

Primary Key

Name	Column
PP_PK	POR_ID
	PAR_SSN_EIN
	PAR_CREATED_DATE

Foreign Keys

PP_PAR_FK

PAR_SSN_EIN references PARTICIPANTS.SSN_EIN
PAR_CREATED_DATE references PARTICIPANTS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

PP_POR_FK

POR_ID references PORTS.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Table Name : PARTICIPANT_PORTS Alias :PP

Display Title : Participant Ports

Object Type:
Comment :

Index Summary

Name	Seq.	Column	Index Type
----AR_FK_I	----	------N_EIN	N---------
PP_PAR_FK_I	2	PAR_CREATED_DATE	NOT UNIQUE
PP_POR_FK_I	1	POR_ID	NOT UNIQUE

Table Name : PARTICIPANT_ROLES Alias :PR

Display Title : Participant Roles

Object Type:
Comment :

Description : The authorization that a participant has been granted

Notes : This represents the authorization that has been granted to a participant within the system. This authorization is used to determine what features and activities a participant may use.

User/Help Text :The authorization that a participant has been granted

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ROL_ID	NOT NULL	NUMBER (10)
2	PAR_SSN_EIN	NOT NULL	NUMBER (11)
3	PAR_CREATED_DATE	NOT NULL	DATE
4	AUTHORIZATION_AUTHORIZATION	NOT NULL	CHAR (1)

Primary Key

Name	Column
PR_PK	PAR_SSN_EIN PAR_CREATED_DATE ROL_ID

Table Name : PARTICIPANT_ROLES Alias :PR

Display Title : Participant Roles

Object Type:
Comment :

Foreign Keys

PR_PAR_FK

PAR_SSN_EIN references PARTICIPANTS.SSN_EIN
PAR_CREATED_DATE references PARTICIPANTS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

PR_ROL_FK

ROL_ID references ROLES.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----AR_FK_I	----	------N_EIN	N---------
PR_PAR_FK_I	2	PAR_CREATED_DATE	NOT UNIQUE
PR_ROL_FK_I	1	ROL_ID	NOT UNIQUE

Table Name : PARTICIPANT_TRIP_ROLES Alias :PTR

Display Title : Participant Trip Roles

Object Type:

Comment :

Description : The specific role that a person holds while on a fishing trip.

Notes : This entity will contain the data related to the roles of the participants during a trip. The primary key for this record will be a combination of the primary keys from the Trip and Role entities.

User/Help Text :The specific role that a person holds while on a fishing trip.

Volumes

Start Rows : End Rows :

Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	TRI_CREATED_DATE	NOT NULL	DATE
2	TRI_VES_CREATED_DATE	NOT NULL	DATE
3	TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
4	TRI_VES_HID	NOT NULL	VARCHAR2 (12)
5	PR_PAR_CREATED_DATE	NOT NULL	DATE
6	PR_PAR_SSN_EIN	NOT NULL	NUMBER (11)
7	PR_ROL_ID	NOT NULL	NUMBER (10)

Primary Key

Name	Column
PTR_PK	TRI_CREATED_DATE
	TRI_TRIP_NUMBER
	TRI_VES_HID
	TRI_VES_CREATED_DATE
	PR_PAR_SSN_EIN
	PR_PAR_CREATED_DATE
	PR_ROL_ID

Table Name : PARTICIPANT_TRIP_ROLES Alias :PTR

Display Title : Participant Trip Roles

Object Type:

Comment :

Foreign Keys

PTR_PR_FK

PR_PAR_SSN_EIN references PARTICIPANT_ROLES.PAR_SSN_EIN
PR_PAR_CREATED_DATE references PARTICIPANT_ROLES.PAR_CREATED_DATE
PR_ROL_ID references PARTICIPANT_ROLES.ROL_ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

PTR_TRI_FK

TRI_CREATED_DATE references TRIPS.CREATED_DATE
TRI_TRIP_NUMBER references TRIPS.TRIP_NUMBER
TRI_VES_HID references TRIPS.VES_HID
TRI_VES_CREATED_DATE references TRIPS.VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----PR_FK_I	----	------_SSN_EIN	N---------
PTR_PR_FK_I	2	PR_PAR_CREATED_DATE	NOT UNIQUE
PTR_PR_FK_I	3	PR_ROL_ID	NOT UNIQUE
PTR_TRI_FK_I	1	TRI_CREATED_DATE	NOT UNIQUE
PTR_TRI_FK_I	2	TRI_TRIP_NUMBER	NOT UNIQUE
PTR_TRI_FK_I	3	TRI_VES_HID	NOT UNIQUE
PTR_TRI_FK_I	4	TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : PERMIT_LICENSES Alias :PL

Display Title : Permit Licenses

Object Type:
Comment :

Description : One of the legal documents allowing a participant to harvest fish.

Notes : This entity will contain the data related to licenses. These licenses can be fishing, commercial or recreational, processor and/or dealer/buyer. The primary key for this record is a combination of the primary key from the Participant entity and the license number.

User/Help Text :One of the legal documents allowing a participant to harvest fish.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	VES_CREATED_DATE	NOT NULL	DATE
2	VES_HID	NOT NULL	VARCHAR2 (12)
3	PAR_SSN_EIN	NOT NULL	NUMBER (11)
4	PERMIT_LICENSE_NUMBER	NOT NULL	VARCHAR2 (10)
5	TYPE_TYPE	NOT NULL	VARCHAR2 (20)
6	BEGIN_DATE	NOT NULL	DATE
7	END_DATE	NOT NULL	DATE
8	CREATED_BY	NOT NULL	VARCHAR2 (30)
9	CREATED_DATE	NOT NULL	DATE
10	MODIFIED_BY	NULL	VARCHAR2 (30)
11	MODIFIED_DATE	NULL	DATE
12	PAR_CREATED_DATE	NOT NULL	DATE
13	IA_ID	NOT NULL	NUMBER (10)

Primary Key

Name	Column

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Table Name : PERMIT_LICENSES Alias :PL

Display Title : Permit Licenses

Object Type:
Comment :

Name	Column
PL_PK	PERMIT_LICENSE_NUMBER
	TYPE_TYPE
	CREATED_DATE
	PAR_SSN_EIN
	PAR_CREATED_DATE

Foreign Keys

PL_IA_FK

IA_ID references ISSUING_AUTHORITIES.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

PL_PAR_FK

PAR_SSN_EIN references PARTICIPANTS.SSN_EIN
PAR_CREATED_DATE references PARTICIPANTS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

PL_VES_FK

VES_HID references VESSELS.HID
VES_CREATED_DATE references VESSELS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----A_FK_I	----	------	N---------
PL_PAR_FK_I	1	PAR_SSN_EIN	NOT UNIQUE
PL_PAR_FK_I	2	PAR_CREATED_DATE	NOT UNIQUE
PL_VES_FK_I	1	VES_HID	NOT UNIQUE
PL_VES_FK_I	2	VES_CREATED_DATE	NOT UNIQUE

Table Name : PORTS Alias :POR

Display Title : Ports

Object Type:
Comment :

Description : The seaport where vessels are home ported out of, trips begin and end or fish are landed at.

Notes : This entity will contain the data related to a port. The primary key for this record will be a unique number generated by an Oracle sequence.

User/Help Text :The seaport where vessels are home ported out of, trips begin and end or fish are landed at.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	MA_ID	NOT NULL	NUMBER (10)
2	ID	NOT NULL	NUMBER (10)
3	CODE	NOT NULL	VARCHAR2 (4)
4	NAME	NOT NULL	VARCHAR2 (40)
5	CITY	NOT NULL	VARCHAR2 (25)
6	STATE_PROVINCE	NOT NULL	VARCHAR (2)
7	ZIP_POSTAL_CODE	NOT NULL	VARCHAR2 (13)
8	COUNTRY	NOT NULL	VARCHAR2 (10)
9	CREATED_BY	NOT NULL	VARCHAR2 (30)
10	CREATED_DATE	NOT NULL	DATE
11	MODIFIED_BY	NULL	VARCHAR2 (30)
12	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
POR_PK	ID

Table Name : PORTS Alias :POR

Display Title : Ports

Object Type:
Comment :

Foreign Keys

POR_MA_FK

MA_ID references MANAGEMENT_AREAS.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----MA_FK_I	----	------	N---------

Table Name : PROCESSING_EQUIPMENT Alias :PE

Display Title : Processing Equipment
Object Type:
Comment :

Description : The equipment located on a vessel use in the processing of fish.

Notes : This entity will contain the data related to the equipment needed to processes fish onboard a vessel. This data will be utilized primarily for analysis. The primary key for this record will be a combination of the primary key from the Vessel entity and a unique number generated by an Oracle sequence.

User/Help Text :The equipment located on a vessel use in the processing of fish.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	VES_CREATED_DATE	NOT NULL	DATE
2	ID	NOT NULL	NUMBER (10)
3	TYPE_TYPE	NOT NULL	VARCHAR2 (15)
4	MAKE	NULL	VARCHAR2 (15)
5	MODEL	NULL	VARCHAR2 (15)
6	AMOUNT	NULL	NUMBER (3)
7	AGE	NULL	NUMBER (2)
8	LIFE_EXPECTANCY	NULL	NUMBER (2)
9	CREATED_BY	NOT NULL	VARCHAR2 (30)
10	CREATED_DATE	NOT NULL	DATE
11	VES_HID	NOT NULL	VARCHAR2 (12)
12	MODIFIED_BY	NULL	VARCHAR2 (30)
13	MODIFIED_DATE	NULL	DATE

Primary Key

Table Name : PROCESSING_EQUIPMENT Alias :PE

Display Title : Processing Equipment
Object Type:
Comment :

Name	Column
PE_PK	ID
	VES_HID
	VES_CREATED_DATE

Foreign Keys

PE_VES_FK

VES_HID references VESSELS.HID
VES_CREATED_DATE references VESSELS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----ES_FK_I	----	------D	N---------
PE_VES_FK_I	2	VES_CREATED_DATE	NOT UNIQUE

Table Name : PROPULSION_SYSTEMS Alias :PS

Display Title : Propulsion Systems

Object Type:
Comment :

Description : The type of propulsion systems (main, auxiliary) that are installed on the vessel.

Notes : This entity will contain the data related to the propulsion systems onboard a vessel. This data will be utilized primarily for analysis. The primary key for this record will be a combination of the primary key from the Vessel entity and a unique number generated by an Oracle sequence.

User/Help Text :The type of propulsion systems (main, auxiliary) that are installed on the vessel.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	VES_HID	NOT NULL	VARCHAR2 (12)
2	VES_CREATED_DATE	NOT NULL	DATE
3	ID	NOT NULL	NUMBER (10)
4	TYPE_TYPE	NOT NULL	CHAR (1)
5	ENGINE_TYPE	NOT NULL	VARCHAR2 (8)
6	ENGINE_MAKE	NULL	VARCHAR2 (15)
7	ENGINE_MODEL	NULL	VARCHAR2 (15)
8	HORSEPOWER	NULL	NUMBER (8)
9	ENGINE_AGE	NULL	NUMBER (2)
10	OVERHAUL_DATE	NULL	DATE
11	LIFE_EXPECTANCY	NULL	NUMBER (2)
12	CREATED_BY	NOT NULL	VARCHAR2 (30)
13	CREATED_DATE	NOT NULL	DATE
14	MODIFIED_BY	NULL	VARCHAR2 (30)

Table Name : PROPULSION_SYSTEMS Alias :PS

Display Title : Propulsion Systems

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
15	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
PS_PK	ID
	VES_HID
	VES_CREATED_DATE

Foreign Keys

PS_VES_FK

VES_HID references VESSELS.HID
VES_CREATED_DATE references VESSELS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----ES_FK_I	----	------D	N---------
PS_VES_FK_I	2	VES_CREATED_DATE	NOT UNIQUE

Table Name : PROTECT_SPECIES_CHARS Alias :PSC

Display Title : Protected Species Chars

Object Type:

Comment :

Description : A specific characteristic for a type of fishing. The fisherman or observer will need to record information about different type of fishing activities. This entity will allow for this,

Notes : This entity will contain the data related to fishing activity characteristics. This data will be selected by the fisherman.

User/Help Text :A specific characteristic for a type of fishing. The fisherman or observer will need to record information about different type of fishing activities. This entity will allow for this,

Volumes

Start Rows : End Rows :

Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	CTG_CODE	NOT NULL	VARCHAR2 (4)
2	ID	NOT NULL	NUMBER (10)
3	NAME	NOT NULL	VARCHAR2 (30)
4	HIGH_VALUE	NOT NULL	VARCHAR2 (20)
5	LOW_VALUE	NOT NULL	VARCHAR2 (20)
6	CTG_CREATED_DATE	NOT NULL	DATE
7	DEFAULT_VALUE	NOT NULL	VARCHAR2 (20)
8	REQUIRED	NOT NULL	CHAR (1)
9	CREATED_BY	NOT NULL	VARCHAR2 (30)
10	CREATED_DATE	NOT NULL	DATE
11	MODIFIED_BY	NULL	VARCHAR2 (30)
12	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column

Table Name : PROTECT_SPECIES_CHARS Alias :PSC

Display Title : Protected Species Chars

Object Type:

Comment :

Name	Column
PSC_PK	ID

Other Unique Keys

Name	Column
PSC1_UK	DE
	CTG_CREATED_DATE

Foreign Keys

PSC_CTG_FK

CTG_CODE references CATEGORIES.CODE
CTG_CREATED_DATE references CATEGORIES.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
CTG_FK_I_1		DE	N
PSC_CTG_FK_I_1	2	CTG_CREATED_DATE	NOT UNIQUE

Table Name : PROTECT_SPECIES_INCIDENT_TK Alias :PSIT

Display Title : Protect Species Incident

Object Type: Takes

Comment :

Description : The accidental killing of a protected or endangered species

Notes : This repsents the accidental killing of a protected or endangered species.

User/Help Text :The accidental killing of a protected or endangered species

Volumes

Start Rows : End Rows :

Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	TIMESTAMP	NOT NULL	DATE
2	LENGTH	NULL	NUMBER (4)
3	LENGTH_UM	NULL	CHAR (3)
4	ENTANGLEMENT_SITUTATION	NULL	VARCHAR2 (2)
5	CONDITION	NULL	VARCHAR2 (2)
6	BROUGHT_ONBOARD	NULL	CHAR (1)
7	PHOTOS_TAKEN	NULL	CHAR (1)
8	MEASUREMENT_TAKEN	NULL	CHAR (1)
9	SAMPLE_TAKEN	NULL	CHAR (1)
10	CAPTAIN_NOTIFIED	NULL	CHAR (1)
11	CAPTAIN_PARTICIPATE	NULL	CHAR (1)
12	NUMBER_OF_BIRDS	NULL	NUMBER (2)
13	CREATED_BY	NULL	VARCHAR2 (30)
14	CREATED_DATE	NULL	DATE
15	MODIFIED_BY	NULL	VARCHAR2 (30)
16	MODIFIED_DATE	NULL	DATE

Table Name : PROTECT_SPECIES_INCIDENT_TK Alias :PSIT

Display Title : Protect Species Incident

Object Type: Takes

Comment :

Col.Seq.	Column	Nulls ?	Type
17	FA_ACTIVITY_START	NOT NULL	DATE
18	FA_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
19	FA_TRI_CREATED_DATE	NOT NULL	DATE
20	FA_CREATED_DATE	NOT NULL	DATE
21	FA_TRI_VES_HID	NOT NULL	VARCHAR2 (12)
22	FA_TRI_VES_CREATED_DATE	NOT NULL	DATE

Primary Key

Name	Column
PSIT_PK	TIMESTAMP FA_ACTIVITY_START FA_CREATED_DATE FA_TRI_CREATED_DATE FA_TRI_TRIP_NUMBER FA_TRI_VES_HID FA_TRI_VES_CREATED_DATE

Index Summary

Name	Seq.	Column	Index Type
----_FA_FK_I	----	------IVITY_START	N---------
PSIT_FA_FK_I	2	FA_CREATED_DATE	NOT UNIQUE
PSIT_FA_FK_I	3	FA_TRI_CREATED_DATE	NOT UNIQUE
PSIT_FA_FK_I	4	FA_TRI_TRIP_NUMBER	NOT UNIQUE
PSIT_FA_FK_I	5	FA_TRI_VES_HID	NOT UNIQUE
PSIT_FA_FK_I	6	FA_TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : PROTECT_SPECIES_SIGHTS Alias :PSS

Display Title : Protect Species Sights

Object Type:

Comment :

Description : The sighting of a protected species

Notes : This represents the sighting of a protected species of marine mammal.

User/Help Text :The sighting of a protected species

Volumes

Start Rows : 0 End Rows : 10000

Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	SPEC_SCIENTIFIC_NAME	NOT NULL	VARCHAR2 (40)
2	TIMESTAMP	NOT NULL	DATE
3	LATITUDE	NOT NULL	NUMBER (8, 5)
4	LONGITUDE	NOT NULL	NUMBER (9, 5)
5	EVENT_TYPE	NULL	VARCHAR2 (2)
6	POSITION	NULL	VARCHAR2 (2)
7	WEATHER	NULL	VARCHAR2 (10)
8	WAVE_HEIGHT	NULL	NUMBER (2)
9	WAVE_HEIGHT_UM	NULL	CHAR (3)
10	NUMBER_OF_ANIMALS	NULL	NUMBER (3)
11	SIGHTING_CODE	NULL	VARCHAR2 (2)
12	ANIMAL_CONDITION	NULL	VARCHAR2 (2)
13	ANIMAL_BEHAVIOR	NULL	VARCHAR2 (2)
14	NOTES	NULL	VARCHAR2 (250)
15	CREATED_BY	NOT NULL	VARCHAR2 (30)
16	CREATED_DATE	NOT NULL	DATE
17	MODIFIED_BY	NULL	VARCHAR2 (30)

Table Name : PROTECT_SPECIES_SIGHTS Alias :PSS

Display Title : Protect Species Sights
Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
18	MODIFITED_DATE	NULL	DATE
19	TRI_CREATED_DATE	NOT NULL	DATE
20	TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
21	TRI_VES_HID	NOT NULL	VARCHAR2 (12)
22	TRI_VES_CREATED_DATE	NOT NULL	DATE

Primary Key

Name	Column
PSS_PK	TIMESTAMP
	TRI_CREATED_DATE
	TRI_TRIP_NUMBER
	TRI_VES_HID
	TRI_VES_CREATED_DATE

Foreign Keys

PSS_SPEC_FK

SPEC_SCIENTIFIC_NAME references SPECIES.SCIENTIFIC_NAME
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

PSS_TRI_FK

TRI_CREATED_DATE references TRIPS.CREATED_DATE
TRI_TRIP_NUMBER references TRIPS.TRIP_NUMBER
TRI_VES_HID references TRIPS.VES_HID
TRI_VES_CREATED_DATE references TRIPS.VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Table Name : PROTECT_SPECIES_SIGHTS Alias :PSS

Display Title : Protect Species Sights

Object Type:

Comment :

Index Summary

Name	Seq.	Column	Index Type
----SPEC_FK_I	----	------CIENTIFIC_NAME	N---------
PSS_TRI_FK_I	1	TRI_CREATED_DATE	NOT UNIQUE
PSS_TRI_FK_I	2	TRI_TRIP_NUMBER	NOT UNIQUE
PSS_TRI_FK_I	3	TRI_VES_HID	NOT UNIQUE
PSS_TRI_FK_I	4	TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : PROTECT_SPECIES_VALS Alias :PSV

Display Title : Protected Species Values

Object Type:

Comment :

Description : A specific value for a characteristics of a type of fishing activity.

Notes : This entity will contain the data related to Fishing Activity Values. The values will be entered by the fisherman and are related to the Fishing Activity Characteristic entity. The fisherman can enter as many or as few characteristics and their values as he feels necessary.

User/Help Text :A specific value for a characteristics of a type of fishing activity.

Volumes

Start Rows : End Rows :

Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	VALUE	NOT NULL	VARCHAR2 (20)
3	PSIT_FA_TRI_CREATED_DATE	NOT NULL	DATE
4	PSIT_FA_CREATED_DATE	NOT NULL	DATE
5	PSC_ID	NOT NULL	NUMBER (10)
6	PSIT_TIMESTAMP	NOT NULL	DATE
7	PSIT_FA_ACTIVITY_START	NOT NULL	DATE
8	VALUE_UNITS	NOT NULL	VARCHAR2 (5)
9	CREATED_BY	NOT NULL	VARCHAR2 (30)
10	CREATED_DATE	NOT NULL	DATE
11	MODIFIED_BY	NULL	VARCHAR2 (30)
12	MODIFIED_DATE	NULL	DATE
13	PSIT_FA_TRI_VES_CREATED_DATE	NOT NULL	DATE
14	PSIT_FA_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)

Table Name : PROTECT_SPECIES_VALS Alias :PSV

Display Title : Protected Species Values

Object Type:

Comment :

Col.Seq.	Column	Nulls ?	Type
15	PSIT_FA_TRI_VES_HID	NOT NULL	VARCHAR2 (12)

Primary Key

Name	Column
PSV_PK	ID

Other Unique Keys

Name	Column
----PSV1_UK	------IMESTAMP
	PSIT_FA_ACTIVITY_START
	PSIT_FA_CREATED_DATE
	PSIT_FA_TRI_CREATED_DATE
	PSIT_FA_TRI_TRIP_NUMBER
	PSIT_FA_TRI_VES_HID
	PSIT_FA_TRI_VES_CREATED_DATE
	PSC_ID

Foreign Keys

PSV_PSC_FK

PSC_ID references PROTECT_SPECIES_CHARS.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

PSV_PSIT_FK

PSIT_TIMESTAMP references PROTECT_SPECIES_INCIDENT_TK.TIMESTAMP
PSIT_FA_ACTIVITY_START references
PROTECT_SPECIES_INCIDENT_TK.FA_ACTIVITY_START
PSIT_FA_CREATED_DATE references
PROTECT_SPECIES_INCIDENT_TK.FA_CREATED_DATE
PSIT_FA_TRI_CREATED_DATE references
PROTECT_SPECIES_INCIDENT_TK.FA_TRI_CREATED_DATE
PSIT_FA_TRI_TRIP_NUMBER references
PROTECT_SPECIES_INCIDENT_TK.FA_TRI_TRIP_NUMBER
PSIT_FA_TRI_VES_HID references
PROTECT_SPECIES_INCIDENT_TK.FA_TRI_VES_HID
PSIT_FA_TRI_VES_CREATED_DATE references
PROTECT_SPECIES_INCIDENT_TK.FA_TRI_VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted
Mandatory ? Yes Delete Rule : Restricted

Table Name : PROTECT_SPECIES_VALS Alias :PSV

Display Title : Protected Species Values
Object Type:
Comment :

Index Summary

Name	Seq.	Column	Index Type
----PSC_FK_I	----	------	N---------
PSV_PSIT_FK_I	1	PSIT_TIMESTAMP	NOT UNIQUE
PSV_PSIT_FK_I	2	PSIT_FA_ACTIVITY_START	NOT UNIQUE
PSV_PSIT_FK_I	3	PSIT_FA_CREATED_DATE	NOT UNIQUE
PSV_PSIT_FK_I	4	PSIT_FA_TRI_CREATED_DATE	NOT UNIQUE
PSV_PSIT_FK_I	5	PSIT_FA_TRI_TRIP_NUMBER	NOT UNIQUE
PSV_PSIT_FK_I	6	PSIT_FA_TRI_VES_HID	NOT UNIQUE
PSV_PSIT_FK_I	7	PSIT_FA_TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : QUOTA_SHARES Alias :QS

Display Title : Quota Shares

Object Type:
Comment :

Description : The amount of quota shares held by a participant.

Notes : This entry will contain the data related to quota share. The quota shares is authorization to harvest a specific amount of fish. A license is also needed in order to actually harvest fish. The primary key for this record will be a combination of the primary key from the Participant entity and the Quota Share ID.

User/Help Text :The amount of quota shares held by a participant.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	IA_ID	NOT NULL	NUMBER (10)
2	LIM_CTG_CREATED_DATE	NOT NULL	DATE
3	LIM_CTG_CODE	NOT NULL	VARCHAR2 (4)
4	PAR_CREATED_DATE	NOT NULL	DATE
5	QUOTA_SHARE_NUMBER	NOT NULL	NUMBER (10)
6	TYPE_TYPE	NOT NULL	CHAR (3)
7	VESSEL_CLASS	NOT NULL	CHAR (1)
8	AMOUNT	NOT NULL	NUMBER (6)
9	CREATED_BY	NOT NULL	VARCHAR2 (30)
10	CREATED_DATE	NOT NULL	DATE
11	LIM_ID	NOT NULL	NUMBER (10)
12	MODIFIED_BY	NULL	VARCHAR2 (30)
13	MODIFIED_DATE	NULL	DATE
14	PAR_SSN_EIN	NOT NULL	NUMBER (11)

Primary Key

Table Name : QUOTA_SHARES Alias :QS

Display Title : Quota Shares

Object Type:
Comment :

Name	Column
QS_PK	QUOTA_SHARE_NUMBER
	PAR_SSN_EIN
	PAR_CREATED_DATE
	LIM_ID
	LIM_CTG_CODE
	LIM_CTG_CREATED_DATE

Foreign Keys

QS_IA_FK

IA_ID references ISSUING_AUTHORITIES.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

QS_LIM_FK

LIM_ID references LIMITS.ID
LIM_CTG_CODE references LIMITS.CTG_CODE
LIM_CTG_CREATED_DATE references LIMITS.CTG_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

QS_PAR_FK

PAR_SSN_EIN references PARTICIPANTS.SSN_EIN
PAR_CREATED_DATE references PARTICIPANTS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Table Name : QUOTA_SHARES Alias :QS

Display Title : Quota Shares

Object Type:
Comment :

Index Summary

Name	Seq.	Column	Index Type
----A_FK_I	----	------	N---------
QS_LIM_FK_I_1	1	LIM_ID	NOT UNIQUE
QS_LIM_FK_I_1	2	LIM_CTG_CODE	NOT UNIQUE
QS_LIM_FK_I_1	3	LIM_CTG_CREATED_DATE	NOT UNIQUE
QS_PAR_FK_I	1	PAR_SSN_EIN	NOT UNIQUE
QS_PAR_FK_I	2	PAR_CREATED_DATE	NOT UNIQUE

Table Name : QUOTA_SHARE_TRIPS Alias :QST

Display Title : Quota Share Trips

Object Type:
Comment :

Description : The amount of quota shares held by a participant that can be fished on

User/Help Text :The amount of quota shares held by a participant that can be fished on

Volumes

Start Rows : End Rows :

Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
2	TRI_CREATED_DATE	NOT NULL	DATE
3	TRI_VES_CREATED_DATE	NOT NULL	DATE
4	TRI_VES_HID	NOT NULL	VARCHAR2 (12)
5	QS_PAR_CREATED_DATE	NOT NULL	DATE
6	QS_PAR_SSN_EIN	NOT NULL	NUMBER (11)
7	QS_QUOTA_SHARE_NUMBER	NOT NULL	NUMBER (10)
8	QS_LIM_CTG_CODE	NOT NULL	VARCHAR2 (4)
9	QS_LIM_CTG_CREATED_DATE	NOT NULL	DATE
10	QS_LIM_ID	NOT NULL	NUMBER (10)
11	WEIGHT_REMAINING	NOT NULL	NUMBER (6)
12	REMAINING_UM	NOT NULL	CHAR (1)
13	WEIGHT_LANDED	NULL	NUMBER (6)
14	LANDED_UM	NULL	CHAR (1)

Primary Key

Name	Column
QST_PK	TRI_CREATED_DATE
	TRI_TRIP_NUMBER
	TRI_VES_HID

Table Name : QUOTA_SHARE_TRIPS Alias :QST

Display Title : Quota Share Trips

Object Type:
Comment :

Name	Column
	TRI_VES_CREATED_DATE
	QS_QUOTA_SHARE_NUMBER
	QS_PAR_SSN_EIN
	QS_PAR_CREATED_DATE
	QS_LIM_ID
	QS_LIM_CTG_CODE
	QS_LIM_CTG_CREATED_DATE

Foreign Keys

QST_QS_FK

QS_QUOTA_SHARE_NUMBER references QUOTA_SHARES.QUOTA_SHARE_NUMBER
QS_PAR_SSN_EIN references QUOTA_SHARES.PAR_SSN_EIN
QS_PAR_CREATED_DATE references QUOTA_SHARES.PAR_CREATED_DATE
QS_LIM_ID references QUOTA_SHARES.LIM_ID
QS_LIM_CTG_CODE references QUOTA_SHARES.LIM_CTG_CODE
QS_LIM_CTG_CREATED_DATE references
QUOTA_SHARES.LIM_CTG_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

QST_TRI_FK

TRI_CREATED_DATE references TRIPS.CREATED_DATE
TRI_TRIP_NUMBER references TRIPS.TRIP_NUMBER
TRI_VES_HID references TRIPS.VES_HID
TRI_VES_CREATED_DATE references TRIPS.VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Table Name : QUOTA_SHARE_TRIPS Alias :QST

Display Title : Quota Share Trips

Object Type:
Comment :

Index Summary

Name	Seq.	Column	Index Type
----QS_FK_I	----	------TA_SHARE_NUMBER	N---------
QST_QS_FK_I	2	QS_PAR_SSN_EIN	NOT UNIQUE
QST_QS_FK_I	3	QS_PAR_CREATED_DATE	NOT UNIQUE
QST_QS_FK_I	4	QS_LIM_ID	NOT UNIQUE
QST_QS_FK_I	5	QS_LIM_CTG_CODE	NOT UNIQUE
QST_QS_FK_I	6	QS_LIM_CTG_CREATED_DATE	NOT UNIQUE
QST_TRI_FK_I	1	TRI_CREATED_DATE	NOT UNIQUE
QST_TRI_FK_I	2	TRI_TRIP_NUMBER	NOT UNIQUE
QST_TRI_FK_I	3	TRI_VES_HID	NOT UNIQUE
QST_TRI_FK_I	4	TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : ROLES Alias :ROL

Display Title : Roles

Object Type:
Comment :

Description : The roles that a participant might hold. These positions currently are skipper, crew, owner, observer and other. Additional roles could be added in the future as the need arises.

Notes : This entity will contain the data related to the participant roles. A participant may hold several roles. The primary key for this record will be a unique number generated by an Oracle sequence.

User/Help Text :The roles that a participant might hold. These positions currently are skipper, crew, owner, observer and other. Additional roles could be added in the future as the need arises.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	TYPE_TYPE	NOT NULL	VARCHAR2 (12)
3	CREATED_BY	NOT NULL	VARCHAR2 (30)
4	CREATED_DATE	NOT NULL	DATE
5	MODIFIED_BY	NULL	VARCHAR2 (30)
6	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
ROL_PK	ID

Table Name : SENSOR_READINGS Alias :SR

Display Title : Sensor Readings

Object Type:
Comment :

Description : The data obtained from the environmental sensor(s) installed on the vessel.

Notes : This entity will contain data related to the sensor readings taken during a trip. This data will be generated as a result of the sensor data gathered during a trip being downloaded into the database and matched up with a vessel and trip. The primary key for this entity will be a combination of the primary key from the Environmental Sampling entity and a unique number generated from an Oracle sequence.

User/Help Text :The data obtained from the environmental sensor(s) installed on the vessel.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ES_FA_CREATED_DATE	NOT NULL	DATE
2	ES_FA_TRI_CREATED_DATE	NOT NULL	DATE
3	ES_FA_TRI_VES_HID	NOT NULL	VARCHAR2 (12)
4	ES_FA_TRI_VES_CREATED_DATE	NOT NULL	DATE
5	ES_FA_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
6	ES_SENSOR_TYPE	NOT NULL	VARCHAR2 (8)
7	TIMESTAMP	NOT NULL	DATE
8	SENSOR_READING	NOT NULL	NUMBER (8, 5)
9	ES_CREATED_DATE	NOT NULL	DATE
10	ES_FA_ACTIVITY_START	NOT NULL	DATE
11	ES_ID	NOT NULL	NUMBER (10)

Primary Key

Table Name : SENSOR_READINGS Alias :SR

Display Title : Sensor Readings

Object Type:
Comment :

Name	Column
SR_PK	TIMESTAMP
	ES_SENSOR_TYPE
	ES_ID
	ES_CREATED_DATE
	ES_FA_ACTIVITY_START
	ES_FA_CREATED_DATE
	ES_FA_TRI_CREATED_DATE
	ES_FA_TRI_TRIP_NUMBER
	ES_FA_TRI_VES_HID
	ES_FA_TRI_VES_CREATED_DATE

Foreign Keys

SR_ES_FK

ES_SENSOR_TYPE references ENVIRONMENTAL_SENSORS.SENSOR_TYPE
ES_ID references ENVIRONMENTAL_SENSORS.ID
ES_CREATED_DATE references ENVIRONMENTAL_SENSORS.CREATED_DATE
ES_FA_ACTIVITY_START references ENVIRONMENTAL_SENSORS.FA_ACTIVITY_START
ES_FA_CREATED_DATE references ENVIRONMENTAL_SENSORS.FA_CREATED_DATE
ES_FA_TRI_CREATED_DATE references ENVIRONMENTAL_SENSORS.FA_TRI_CREATED_DATE
ES_FA_TRI_TRIP_NUMBER references ENVIRONMENTAL_SENSORS.FA_TRI_TRIP_NUMBER
ES_FA_TRI_VES_HID references ENVIRONMENTAL_SENSORS.FA_TRI_VES_HID
ES_FA_TRI_VES_CREATED_DATE references ENVIRONMENTAL_SENSORS.FA_TRI_VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Table Name : SENSOR_READINGS Alias :SR

Display Title : Sensor Readings

Object Type:
Comment :

Index Summary

Name	Seq.	Column	Index Type
----S_FK_I	----	------SOR_TYPE	N---------
SR_ES_FK_I	2	ES_ID	NOT UNIQUE
SR_ES_FK_I	3	ES_CREATED_DATE	NOT UNIQUE
SR_ES_FK_I	4	ES_FA_ACTIVITY_START	NOT UNIQUE
SR_ES_FK_I	5	ES_FA_CREATED_DATE	NOT UNIQUE
SR_ES_FK_I	6	ES_FA_TRI_CREATED_DATE	NOT UNIQUE
SR_ES_FK_I	7	ES_FA_TRI_TRIP_NUMBER	NOT UNIQUE
SR_ES_FK_I	8	ES_FA_TRI_VES_HID	NOT UNIQUE
SR_ES_FK_I	9	ES_FA_TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : SPECIES Alias :SPEC

Display Title : Species

Object Type:
Comment :

Description : This is the genus & species name of organisms caught, landed or interacting with fishing activities. This combination is used in conjunction with its common name to more easily identify fish.

Notes : This entity will contain the bionomila scientific names of organisms and their common names. The primary key will be the combination of Genus and Species Names.

User/Help Text :This is the genus & species name of organisms caught, landed or interacting with fishing activities. This combination is used in conjunction with its common name to more easily identify fish.

Volumes

Start Rows : 2000 End Rows : 40000
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	SCIENTIFIC_NAME	NOT NULL	VARCHAR2 (40)
2	COMMON_NAME	NOT NULL	VARCHAR2 (40)
3	AVG_PROPORTION	NOT NULL	NUMBER (5)
4	CREATED_BY	NOT NULL	VARCHAR2 (30)
5	CREATED_DATE	NOT NULL	DATE
6	MODIFIED_BY	NULL	VARCHAR2 (30)
7	MODIFIED_DATE	NULL	DATE
8	CTG_CODE	NOT NULL	VARCHAR2 (4)
9	CTG_CREATED_DATE	NOT NULL	DATE

Primary Key

Name	Column
SPEC_PK	SCIENTIFIC_NAME

Table Name : SPECIES Alias :SPEC

Display Title : Species

Object Type:
Comment :

Foreign Keys

SPEC_CTG_FK

CTG_CODE references CATEGORIES.CODE
CTG_CREATED_DATE references CATEGORIES.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----_CTG_FK_I	----	------DE	N---------
SPEC_CTG_FK_I	2	CTG_CREATED_DATE	NOT UNIQUE

Table Name : SPECIES_COMPOSITIONS Alias :SC

Display Title : Species Compositions

Object Type:

Comment :

Description : This entity represents the individual samples that are taken at the time of landing. These samples will be dissected and specimens will be taken and examined.

User/Help Text :This entity represents the individual samples that are taken at the time of landing. These samples will be dissected and specimens will be taken and examined.

Volumes

Start Rows : End Rows :

Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	TOTAL_FISH	NULL	NUMBER (3)
3	TOTAL_WEIGHT	NULL	NUMBER (6)
4	TOTAL_WEIGHT_UM	NULL	CHAR (1)
5	COMMENTS	NULL	VARCHAR2 (30)
6	CREATED_BY	NOT NULL	VARCHAR2 (30)
7	CREATED_DATE	NOT NULL	DATE
8	MODIFIED_BY	NULL	VARCHAR2 (30)
9	MODIFIED_DATE	NULL	DATE
10	SS_LD_LAN_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
11	SS_LD_LAN_TRI_VES_HID	NOT NULL	VARCHAR2 (12)
12	SS_LD_LAN_TRI_CREATED_DATE	NOT NULL	DATE
13	SS_LD_LAN_TRI_VES_CREATED_DATE	NOT NULL	DATE
14	SS_LD_LAN_PAR_SSN_EIN	NOT NULL	NUMBER (11)
15	SS_FA_CREATED_DATE	NOT NULL	DATE
16	SS_FA_ACTIVITY_START	NOT NULL	DATE

Table Name : SPECIES_COMPOSITIONS Alias :SC

Display Title : Species Compositions

Object Type:

Comment :

Col.Seq.	Column	Nulls ?	Type
17	SS_LD_LINE_NUMBER	NOT NULL	NUMBER (2, 0)
18	SS_CREATED_DATE	NOT NULL	DATE
19	SS_ID	NOT NULL	NUMBER (10)
20	SS_FA_TRI_CREATED_DATE	NOT NULL	DATE
21	SS_FA_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
22	SS_FA_TRI_VES_HID	NOT NULL	VARCHAR2 (12)
23	SS_PAR_CREATED_DATE	NOT NULL	DATE
24	SS_LD_LAN_PAR_CREATED_DATE	NOT NULL	DATE
25	SS_PAR_SSN_EIN	NOT NULL	NUMBER (11)
26	SS_LD_CTG_CODE	NOT NULL	VARCHAR2 (4)
27	SS_LD_CREATED_DATE	NOT NULL	DATE
28	SS_LD_LAN_FISH_TICKET_NUMBER	NOT NULL	NUMBER (9)
29	SS_LD_CTG_CREATED_DATE	NOT NULL	DATE
30	SS_LD_LAN_CREATED_DATE	NOT NULL	DATE
31	SS_FA_TRI_VES_CREATED_DATE	NOT NULL	DATE

Primary Key

Name	Column
SC_PK	ID

Table Name : SPECIES_COMPOSITIONS Alias :SC

Display Title : Species Compositions

Object Type:

Comment :

Other Unique Keys

Name	Column
----C1_UK	------
	SS_CREATED_DATE
	SS_LD_LINE_NUMBER
	SS_LD_CREATED_DATE
	SS_LD_CTG_CODE
	SS_LD_CTG_CREATED_DATE
	SS_LD_LAN_FISH_TICKET_NUMBER
	SS_LD_LAN_CREATED_DATE
	SS_LD_LAN_TRI_CREATED_DATE
	SS_LD_LAN_TRI_TRIP_NUMBER
	SS_LD_LAN_TRI_VES_HID
	SS_LD_LAN_TRI_VES_CREATED_DATE
	SS_LD_LAN_PAR_SSN_EIN
	SS_LD_LAN_PAR_CREATED_DATE
	SS_PAR_SSN_EIN
	SS_PAR_CREATED_DATE
	SS_FA_ACTIVITY_START
	SS_FA_CREATED_DATE
	SS_FA_TRI_CREATED_DATE
	SS_FA_TRI_TRIP_NUMBER
	SS_FA_TRI_VES_HID
	SS_FA_TRI_VES_CREATED_DATE

Table Name : SPECIES_COMPOSITIONS Alias :SC

Display Title : Species Compositions
Object Type:
Comment :

Foreign Keys

SC_SS_FK

SS_PAR_SSN_EIN references SUB_SAMPLES.PAR_SSN_EIN
SS_PAR_CREATED_DATE references SUB_SAMPLES.PAR_CREATED_DATE
SS_LD_LINE_NUMBER references SUB_SAMPLES.LD_LINE_NUMBER
SS_LD_LAN_TRI_VES_HID references SUB_SAMPLES.LD_LAN_TRI_VES_HID
SS_LD_LAN_TRI_VES_CREATED_DATE references
SUB_SAMPLES.LD_LAN_TRI_VES_CREATED_DATE
SS_LD_LAN_TRI_TRIP_NUMBER references
SUB_SAMPLES.LD_LAN_TRI_TRIP_NUMBER
SS_LD_LAN_TRI_CREATED_DATE references
SUB_SAMPLES.LD_LAN_TRI_CREATED_DATE
SS_LD_LAN_PAR_SSN_EIN references SUB_SAMPLES.LD_LAN_PAR_SSN_EIN
SS_LD_LAN_PAR_CREATED_DATE references
SUB_SAMPLES.LD_LAN_PAR_CREATED_DATE
SS_LD_LAN_FISH_TICKET_NUMBER references
SUB_SAMPLES.LD_LAN_FISH_TICKET_NUMBER
SS_LD_LAN_CREATED_DATE references SUB_SAMPLES.LD_LAN_CREATED_DATE
SS_LD_CTG_CREATED_DATE references SUB_SAMPLES.LD_CTG_CREATED_DATE
SS_LD_CTG_CODE references SUB_SAMPLES.LD_CTG_CODE
SS_LD_CREATED_DATE references SUB_SAMPLES.LD_CREATED_DATE
SS_ID references SUB_SAMPLES.ID
SS_FA_TRI_VES_HID references SUB_SAMPLES.FA_TRI_VES_HID
SS_FA_TRI_VES_CREATED_DATE references
SUB_SAMPLES.FA_TRI_VES_CREATED_DATE
SS_FA_TRI_TRIP_NUMBER references SUB_SAMPLES.FA_TRI_TRIP_NUMBER
SS_FA_TRI_CREATED_DATE references SUB_SAMPLES.FA_TRI_CREATED_DATE
SS_FA_CREATED_DATE references SUB_SAMPLES.FA_CREATED_DATE
SS_FA_ACTIVITY_START references SUB_SAMPLES.FA_ACTIVITY_START
SS_CREATED_DATE references SUB_SAMPLES.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Table Name : SPECIES_COMPOSITIONS Alias :SC

Display Title : Species Compositions
Object Type:
Comment :

Index Summary

Name	Seq.	Column	Index Type
----S_FK_I	----	------	N---------
SC_SS_FK_I	2	SS_CREATED_DATE	NOT UNIQUE
SC_SS_FK_I	3	SS_LD_LINE_NUMBER	NOT UNIQUE
SC_SS_FK_I	4	SS_LD_CREATED_DATE	NOT UNIQUE
SC_SS_FK_I	5	SS_LD_CTG_CODE	NOT UNIQUE
SC_SS_FK_I	6	SS_LD_CTG_CREATED_DATE	NOT UNIQUE
SC_SS_FK_I	7	SS_LD_LAN_FISH_TICKET_NUMBER	NOT UNIQUE
SC_SS_FK_I	8	SS_LD_LAN_CREATED_DATE	NOT UNIQUE
SC_SS_FK_I	9	SS_LD_LAN_TRI_CREATED_DATE	NOT UNIQUE
SC_SS_FK_I	10	SS_LD_LAN_TRI_TRIP_NUMBER	NOT UNIQUE
SC_SS_FK_I	11	SS_LD_LAN_TRI_VES_HID	NOT UNIQUE
SC_SS_FK_I	12	SS_LD_LAN_TRI_VES_CREATED_DATE	NOT UNIQUE
SC_SS_FK_I	13	SS_LD_LAN_PAR_SSN_EIN	NOT UNIQUE
SC_SS_FK_I	14	SS_LD_LAN_PAR_CREATED_DATE	NOT UNIQUE
SC_SS_FK_I	15	SS_PAR_SSN_EIN	NOT UNIQUE
SC_SS_FK_I	16	SS_PAR_CREATED_DATE	NOT UNIQUE
SC_SS_FK_I	17	SS_FA_ACTIVITY_START	NOT UNIQUE
SC_SS_FK_I	18	SS_FA_CREATED_DATE	NOT UNIQUE
SC_SS_FK_I	19	SS_FA_TRI_CREATED_DATE	NOT UNIQUE
SC_SS_FK_I	20	SS_FA_TRI_TRIP_NUMBER	NOT UNIQUE
SC_SS_FK_I	21	SS_FA_TRI_VES_HID	NOT UNIQUE
SC_SS_FK_I	22	SS_FA_TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : SPECIMEN_CHARACTERISTICS Alias :SCHR

Display Title : Specimen Characteristics
Object Type:
Comment :

Description : A specific value for a characteristics of a type of fishing activity.

Notes : This entity will contain the data related to Fishing Activity Values. The values will be entered by the fisherman and are related to the Fishing Activity Characteristic entity. The fisherman can enter as many or as few characteristics and their values as he feels necessary.

User/Help Text :A specific value for a characteristics of a type of fishing activity.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	NAME	NOT NULL	VARCHAR2 (40)
3	VALUE	NOT NULL	VARCHAR2 (20)
4	BS_SPECIMEN_NUMBER	NOT NULL	NUMBER (10)
5	VALUE_UNITS	NOT NULL	VARCHAR2 (5)
6	BS_SC_ID	NOT NULL	NUMBER (10)
7	CREATED_BY	NOT NULL	VARCHAR2 (30)
8	CREATED_DATE	NOT NULL	DATE
9	MODIFIED_BY	NULL	VARCHAR2 (30)
10	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
SCHR_PK	ID
	BS_SPECIMEN_NUMBER
	BS_SC_ID

Table Name : SPECIMEN_CHARACTERISTICS Alias :SCHR

Display Title : Specimen Characteristics
Object Type:
Comment :

Foreign Keys

SCHR_BS_FK

BS_SC_ID references BIOLOGICAL_SPECIMENS.SC_ID
BS_SPECIMEN_NUMBER references BIOLOGICAL_SPECIMENS.SPECIMEN_NUMBER
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----_BS_FK_I	----	------ID	N---------
SCHR_BS_FK_I	2	BS_SPECIMEN_NUMBER	NOT UNIQUE

Table Name : STRUCTURE_MODIFICATIONS Alias :SM

Display Title : Structure Modifications
Object Type:
Comment :

Description : The modification made to a specific vessel.

Notes : This entity will contain the data related to the structural modifications made to a vessel. This data will be utilized primarily for analysis. The primary key for this record will be a combination of the primary key from the Vessel entity and a unique number generated by an Oracle sequence.

User/Help Text :The modification made to a specific vessel.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	MODIFICATION_DATE	NOT NULL	DATE
3	MODIFICATION_DETAILS	NOT NULL	VARCHAR2 (200)
4	CREATED_BY	NOT NULL	VARCHAR2 (30)
5	CREATED_DATE	NOT NULL	DATE
6	MODIFIED_BY	NULL	VARCHAR2 (30)
7	MODIFIED_DATE	NULL	DATE
8	POR_ID	NOT NULL	NUMBER (10)
9	VES_CREATED_DATE	NOT NULL	DATE
10	VES_HID	NOT NULL	VARCHAR2 (12)

Primary Key

Name	Column
SM_PK	ID
	POR_ID
	VES_HID
	VES_CREATED_DATE

Table Name : STRUCTURE_MODIFICATIONS Alias :SM

Display Title : Structure Modifications
Object Type:
Comment :

Foreign Keys

SM_POR_FK

POR_ID references PORTS.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

SM_VES_FK

VES_HID references VESSELS.HID
VES_CREATED_DATE references VESSELS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----OR_FK_I	----	------	N---------
SM_VES_FK_I	1	VES_HID	NOT UNIQUE
SM_VES_FK_I	2	VES_CREATED_DATE	NOT UNIQUE

Table Name : SUB_SAMPLES Alias :SS

Display Title : Sub Samples

Object Type:
Comment :

Description : This entity represents the individual samples that are taken at the time of landing. These samples will be dissected and specimens will be taken and examined.

User/Help Text :This entity represents the individual samples that are taken at the time of landing. These samples will be dissected and specimens will be taken and examined.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	ID	NOT NULL	NUMBER (10)
2	SAMPLE_TIMESTAMP	NOT NULL	DATE
3	SAMPLE_METHOD	NOT NULL	VARCHAR2 (15)
4	DATA_SOURCE	NULL	CHAR (1)
5	DISPOSITION	NULL	CHAR (2)
6	SAMPLE_TYPE	NULL	CHAR (1)
7	COMMENTS	NULL	VARCHAR2 (30)
8	CREATED_BY	NOT NULL	VARCHAR2 (30)
9	CREATED_DATE	NOT NULL	DATE
10	LD_LINE_NUMBER	NOT NULL	NUMBER (2, 0)
11	LD_CREATED_DATE	NOT NULL	DATE
12	LD_CTG_CODE	NOT NULL	VARCHAR2 (4)
13	LD_CTG_CREATED_DATE	NOT NULL	DATE
14	LD_LAN_FISH_TICKET_NUMBER	NOT NULL	NUMBER (9)
15	LD_LAN_CREATED_DATE	NOT NULL	DATE
16	LD_LAN_TRI_CREATED_DATE	NOT NULL	DATE

Table Name : SUB_SAMPLES Alias :SS

Display Title : Sub Samples

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
17	LD_LAN_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
18	LD_LAN_TRI_VES_HID	NOT NULL	VARCHAR2 (12)
19	LD_LAN_TRI_VES_CREATED_DATE	NOT NULL	DATE
20	LD_LAN_PAR_SSN_EIN	NOT NULL	NUMBER (11)
21	LD_LAN_PAR_CREATED_DATE	NOT NULL	DATE
22	MODIFIED_BY	NULL	VARCHAR2 (30)
23	MODIFIED_DATE	NULL	DATE
24	PAR_SSN_EIN	NOT NULL	NUMBER (11)
25	PAR_CREATED_DATE	NOT NULL	DATE
26	FA_ACTIVITY_START	NOT NULL	DATE
27	FA_CREATED_DATE	NOT NULL	DATE
28	FA_TRI_CREATED_DATE	NOT NULL	DATE
29	FA_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
30	FA_TRI_VES_HID	NOT NULL	VARCHAR2 (12)
31	FA_TRI_VES_CREATED_DATE	NOT NULL	DATE

Primary Key

Name	Column
SS_PK	ID
	CREATED_DATE
	LD_LINE_NUMBER
	LD_CREATED_DATE
	LD_CTG_CODE
	LD_CTG_CREATED_DATE
	LD_LAN_FISH_TICKET_NUMBER
	LD_LAN_CREATED_DATE
	LD_LAN_TRI_CREATED_DATE
	LD_LAN_TRI_TRIP_NUMBER
	LD_LAN_TRI_VES_HID
	LD_LAN_TRI_VES_CREATED_DATE
	LD_LAN_PAR_SSN_EIN

Table Name : SUB_SAMPLES Alias :SS

Display Title : Sub Samples

Object Type:
Comment :

Name	Column
	LD_LAN_PAR_CREATED_DATE
	PAR_SSN_EIN
	PAR_CREATED_DATE
	FA_ACTIVITY_START
	FA_CREATED_DATE
	FA_TRI_CREATED_DATE
	FA_TRI_TRIP_NUMBER
	FA_TRI_VES_HID
	FA_TRI_VES_CREATED_DATE

Foreign Keys

SS_LD_FK

LD_CREATED_DATE references LANDING_DETAILS.CREATED_DATE
LD_CTG_CODE references LANDING_DETAILS.CTG_CODE
LD_CTG_CREATED_DATE references LANDING_DETAILS.CTG_CREATED_DATE
LD_LAN_CREATED_DATE references LANDING_DETAILS.LAN_CREATED_DATE
LD_LAN_FISH_TICKET_NUMBER references
LANDING_DETAILS.LAN_FISH_TICKET_NUMBER
LD_LAN_PAR_CREATED_DATE references
LANDING_DETAILS.LAN_PAR_CREATED_DATE
LD_LAN_PAR_SSN_EIN references LANDING_DETAILS.LAN_PAR_SSN_EIN
LD_LAN_TRI_CREATED_DATE references
LANDING_DETAILS.LAN_TRI_CREATED_DATE
LD_LAN_TRI_TRIP_NUMBER references
LANDING_DETAILS.LAN_TRI_TRIP_NUMBER
LD_LAN_TRI_VES_CREATED_DATE references
LANDING_DETAILS.LAN_TRI_VES_CREATED_DATE
LD_LAN_TRI_VES_HID references LANDING_DETAILS.LAN_TRI_VES_HID
LD_LINE_NUMBER references LANDING_DETAILS.LINE_NUMBER
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

SS_PAR_FK

PAR_CREATED_DATE references PARTICIPANTS.CREATED_DATE
PAR_SSN_EIN references PARTICIPANTS.SSN_EIN
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Table Name : SUB_SAMPLES Alias :SS

Display Title : Sub Samples

Object Type:
Comment :

Index Summary

Name	Seq.	Column	Index Type
----A_FK_I	----	------IVITY_START	N---------
SS_FA_FK_I	1	FA_CREATED_DATE	NOT UNIQUE
SS_FA_FK_I	1	FA_TRI_CREATED_DATE	NOT UNIQUE
SS_FA_FK_I	1	FA_TRI_TRIP_NUMBER	NOT UNIQUE
SS_FA_FK_I	1	FA_TRI_VES_HID	NOT UNIQUE
SS_FA_FK_I	1	FA_TRI_VES_CREATED_DATE	NOT UNIQUE
SS_LD_FK_I	1	LD_LINE_NUMBER	NOT UNIQUE
SS_LD_FK_I	1	LD_CREATED_DATE	NOT UNIQUE
SS_LD_FK_I	1	LD_CTG_CODE	NOT UNIQUE
SS_LD_FK_I	1	LD_CTG_CREATED_DATE	NOT UNIQUE
SS_LD_FK_I	1	LD_LAN_FISH_TICKET_NUMBER	NOT UNIQUE
SS_LD_FK_I	1	LD_LAN_CREATED_DATE	NOT UNIQUE
SS_LD_FK_I	1	LD_LAN_TRI_CREATED_DATE	NOT UNIQUE
SS_LD_FK_I	1	LD_LAN_TRI_TRIP_NUMBER	NOT UNIQUE
SS_LD_FK_I	1	LD_LAN_TRI_VES_HID	NOT UNIQUE
SS_LD_FK_I	1	LD_LAN_TRI_VES_CREATED_DATE	NOT UNIQUE
SS_LD_FK_I	1	LD_LAN_PAR_SSN_EIN	NOT UNIQUE
SS_LD_FK_I	1	LD_LAN_PAR_CREATED_DATE	NOT UNIQUE
SS_PAR_FK_I	1	PAR_SSN_EIN	NOT UNIQUE
SS_PAR_FK_I	1	PAR_CREATED_DATE	NOT UNIQUE

Table Name : SYNCHRONIZE Alias :SYN

Display Title : Synchronize

Object Type:
Comment :

Description : This is the last time synchronization occurred

Notes : This is the last time the onboard application master data was synchronized with the central system.

User/Help Text :This is the last time synchronization occurred

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	VESSEL_ID	NOT NULL	NUMBER (10)
2	SKIPPER_ID	NOT NULL	NUMBER (10)
3	SYNC_DATE	NOT NULL	DATE

Primary Key

Name	Column
SYN_PK	VESSEL_ID
	SKIPPER_ID

Table Name : TAGS Alias :TAG

Display Title : Tags

Object Type:
Comment :

Description : An identification attached to a species

Notes : This represents an identifying marker placed on or in a species of fish or marine mammal.

User/Help Text :An identification attached to a species

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	PSIT_TIMESTAMP	NOT NULL	DATE
2	PSIT_FA_ACTIVITY_START	NOT NULL	DATE
3	PSIT_FA_TRI_CREATED_DATE	NOT NULL	DATE
4	PSIT_FA_TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
5	PSIT_FA_TRI_VES_CREATED_DATE	NOT NULL	DATE
6	PSIT_FA_CREATED_DATE	NOT NULL	DATE
7	PSIT_FA_TRI_VES_HID	NOT NULL	VARCHAR2 (12)
8	NUMBER_NUMBER	NOT NULL	VARCHAR2 (10)
9	CODE	NOT NULL	NUMBER (1)
10	CREATED_BY	NOT NULL	VARCHAR2 (30)
11	CREATED_DATE	NOT NULL	DATE
12	MODIFIED_BY	NULL	VARCHAR2 (30)
13	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
TAG_PK	PSIT_TIMESTAMP
	PSIT_FA_ACTIVITY_START

Table Name : TAGS Alias :TAG

Display Title : Tags

Object Type:
Comment :

Name	Column
	PSIT_FA_CREATED_DATE
	PSIT_FA_TRI_CREATED_DATE
	PSIT_FA_TRI_TRIP_NUMBER
	PSIT_FA_TRI_VES_HID
	PSIT_FA_TRI_VES_CREATED_DATE

Foreign Keys

TAG_PSIT_FK

PSIT_TIMESTAMP references PROTECT_SPECIES_INCIDENT_TK.TIMESTAMP
PSIT_FA_ACTIVITY_START references
PROTECT_SPECIES_INCIDENT_TK.FA_ACTIVITY_START
PSIT_FA_CREATED_DATE references
PROTECT_SPECIES_INCIDENT_TK.FA_CREATED_DATE
PSIT_FA_TRI_CREATED_DATE references
PROTECT_SPECIES_INCIDENT_TK.FA_TRI_CREATED_DATE
PSIT_FA_TRI_TRIP_NUMBER references
PROTECT_SPECIES_INCIDENT_TK.FA_TRI_TRIP_NUMBER
PSIT_FA_TRI_VES_HID references
PROTECT_SPECIES_INCIDENT_TK.FA_TRI_VES_HID
PSIT_FA_TRI_VES_CREATED_DATE references
PROTECT_SPECIES_INCIDENT_TK.FA_TRI_VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----PSIT_FK_I	----	------IMESTAMP	N---------
TAG_PSIT_FK_I	2	PSIT_FA_ACTIVITY_START	NOT UNIQUE
TAG_PSIT_FK_I	3	PSIT_FA_CREATED_DATE	NOT UNIQUE
TAG_PSIT_FK_I	4	PSIT_FA_TRI_CREATED_DATE	NOT UNIQUE
TAG_PSIT_FK_I	5	PSIT_FA_TRI_TRIP_NUMBER	NOT UNIQUE
TAG_PSIT_FK_I	6	PSIT_FA_TRI_VES_HID	NOT UNIQUE
TAG_PSIT_FK_I	7	PSIT_FA_TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : TRANSACTIONS Alias :TRA

Display Title : Transactions

Object Type:
Comment :

Description : Information related to transactions that have been sent or received

Notes : This contains information about transactions from the onboard application to the central system.

User/Help Text :Information related to transactions that have been sent or received

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	TRAN_DATE	NOT NULL	DATE
2	VESSEL_ID	NOT NULL	NUMBER (10)
3	XACT_ID	NOT NULL	NUMBER (3)
4	SELECT_DATE	NULL	DATE
5	SELECT_TYPE	NULL	VARCHAR2 (1)
6	UPDATE_AMOUNT	NULL	NUMBER (3)
7	RESPONSE	NULL	NUMBER (2)
8	RESPONSE_DATE	NULL	DATE

Primary Key

Name	Column
TRA_PK	TRAN_DATE VESSEL_ID

Table Name : TRIPS Alias :TRI

Display Title : Trips

Object Type:
Comment :

Description : A fishing trip. A trip consists of a departure port and time and a final landing port and time.

Notes : This entity will contain the data related to a trip. The primary key for this record will be a combination of the primary key from the Vessel entity and a unique number generated by an Oracle sequence.

User/Help Text :A fishing trip. A trip consists of a departure port and time and a final landing port and time.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	TRIP_NUMBER	NOT NULL	NUMBER (10)
2	DEPARTURE_PORT	NOT NULL	VARCHAR2 (25)
3	DEPARTURE_TIMESTAMP	NOT NULL	DATE
4	LANDING_PORT	NULL	VARCHAR2 (25)
5	LANDING_TIMESTAMP	NULL	DATE
6	WAGES	NULL	NUMBER (9, 2)
7	NOTES	NULL	VARCHAR2 (250)
8	REVIEW_FLAG	NULL	CHAR (1)
9	SPATIAL_ITEM_ICON	NULL	LONG RAW ()
10	RELATED_TRIP	NULL	NUMBER (10)
11	CREATED_BY	NOT NULL	VARCHAR2 (30)
12	POR_ID	NOT NULL	NUMBER (10)
13	TRI_TRIP_NUMBER	NULL	NUMBER (10)
14	TRI_VES_HID	NULL	VARCHAR2 (12)
15	TRI_CREATED_DATE	NULL	DATE

Table Name : TRIPS Alias :TRI

Display Title : Trips

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
16	TRI_VES_CREATED_DATE	NULL	DATE
17	VES_HID	NOT NULL	VARCHAR2 (12)
18	VES_CREATED_DATE	NOT NULL	DATE
19	CREATED_DATE	NOT NULL	DATE
20	MODIFIED_BY	NULL	VARCHAR2 (30)
21	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
TRI_PK	CREATED_DATE
	TRIP_NUMBER
	VES_HID
	VES_CREATED_DATE

Table Name : TRIPS Alias :TRI

Display Title : Trips

Object Type:
Comment :

Foreign Keys

TRI_POR_FK

POR_ID references PORTS.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

TRI_TRI_FK

TRI_CREATED_DATE references TRIPS.CREATED_DATE
TRI_TRIP_NUMBER references TRIPS.TRIP_NUMBER
TRI_VES_HID references TRIPS.VES_HID
TRI_VES_CREATED_DATE references TRIPS.VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? No Delete Rule : Restricted

TRI_VES_FK

VES_HID references VESSELS.HID
VES_CREATED_DATE references VESSELS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----POR_FK_I	----	------	N---------
TRI_TRI_FK_I	1	TRI_CREATED_DATE	NOT UNIQUE
TRI_TRI_FK_I	2	TRI_TRIP_NUMBER	NOT UNIQUE
TRI_TRI_FK_I	3	TRI_VES_HID	NOT UNIQUE
TRI_TRI_FK_I	4	TRI_VES_CREATED_DATE	NOT UNIQUE
TRI_VES_FK_I	1	VES_HID	NOT UNIQUE
TRI_VES_FK_I	2	VES_CREATED_DATE	NOT UNIQUE

Table Name : TRIP_PORTS Alias :TP

Display Title : Trip Ports

Object Type:
Comment :

Description : The ports of call for a vessel during a fishing trip they could be visited more that once.

Notes : This entity will contain the data related to the ports visited during a trip. The primary key for this record will be combination of the primary keys from the Trip and Port entities and a sequential number indicating the order of the port visits.

User/Help Text :The ports of call for a vessel during a fishing trip they could be visited more that once.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	CALL_SEQUENCE	NOT NULL	VARCHAR2 (2)
2	CALL_DATE	NOT NULL	DATE
3	TRI_CREATED_DATE	NOT NULL	DATE
4	TRI_TRIP_NUMBER	NOT NULL	NUMBER (10)
5	POR_ID	NOT NULL	NUMBER (10)
6	TRI_VES_CREATED_DATE	NOT NULL	DATE
7	TRI_VES_HID	NOT NULL	VARCHAR2 (12)

Primary Key

Name	Column
TP_PK	CALL_SEQUENCE
	TRI_CREATED_DATE
	TRI_TRIP_NUMBER
	TRI_VES_HID
	TRI_VES_CREATED_DATE
	POR_ID

Table Name : TRIP_PORTS Alias :TP

Display Title : Trip Ports

Object Type:
Comment :

Foreign Keys

TP_POR_FK

POR_ID references PORTS.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

TP_TRI_FK

TRI_CREATED_DATE references TRIPS.CREATED_DATE
TRI_TRIP_NUMBER references TRIPS.TRIP_NUMBER
TRI_VES_HID references TRIPS.VES_HID
TRI_VES_CREATED_DATE references TRIPS.VES_CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----OR_FK_I	----	------	N---------
TP_TRI_FK_I	1	TRI_CREATED_DATE	NOT UNIQUE
TP_TRI_FK_I	2	TRI_TRIP_NUMBER	NOT UNIQUE
TP_TRI_FK_I	3	TRI_VES_HID	NOT UNIQUE
TP_TRI_FK_I	4	TRI_VES_CREATED_DATE	NOT UNIQUE

Table Name : VESSELS Alias :VES

Display Title : Vessels

Object Type:
Comment :

Description : The boat used to catch fish.

Notes : This entity will contain the data related to a vessel. The primary key for this record will be a unique number generated by an Oracle sequence.

User/Help Text :The boat used to catch fish.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	HID	NOT NULL	VARCHAR2 (12)
2	NAME	NOT NULL	VARCHAR2 (40)
3	TYPE_TYPE	NOT NULL	VARCHAR2 (20)
4	CLASS	NULL	CHAR (1)
5	COAST_GUARD_NUMBER	NOT NULL	NUMBER (10)
6	STATE_VESSEL_NUMBER	NULL	NUMBER (10)
7	REG_STATE	NULL	CHAR (2)
8	STATE_DMV_ID	NULL	NUMBER (10)
9	OUT_OF_STATE_NUMBER	NULL	NUMBER (10)
10	HULL_TYPE	NULL	VARCHAR2 (30)
11	MANUFACTURER	NULL	VARCHAR2 (40)
12	YEAR_BUILD	NULL	DATE
13	REGISTERED_LENGTH	NULL	NUMBER (4)
14	REGISTERED_LENGTH_UM	NULL	CHAR (3)
15	OVREALL_LENGTH	NULL	NUMBER (4)
16	OVREALL_LENGTH_UM	NULL	CHAR (3)

Table Name : VESSELS Alias :VES

Display Title : Vessels

Object Type:
Comment :

Col.Seq.	Column	Nulls ?	Type
17	WIDTH	NULL	NUMBER (3)
18	NET_TONNAGE	NULL	NUMBER (4)
19	NET_TONNAGE_UM	NULL	CHAR (1)
20	GROSS_TONNAGE	NULL	NUMBER (4)
21	GROSS_TONNAGE_UM	NULL	CHAR (1)
22	VHF_CALL_SIGN	NOT NULL	VARCHAR2 (8)
23	VESSEL_CELL_PHONE	NULL	VARCHAR2 (12)
24	HOLD_CAPACITY	NULL	NUMBER (4)
25	FUEL_CAPACITY	NULL	NUMBER (5)
26	FUEL_TYPE	NULL	VARCHAR2 (8)
27	POR_ID	NOT NULL	NUMBER (10)
28	GEAR_ENDORSEMENTS	NULL	VARCHAR2 (40)
29	AREA_ENDORSEMENTS	NULL	VARCHAR2 (40)
30	CREATED_BY	NOT NULL	VARCHAR2 (30)
31	CREATED_DATE	NOT NULL	DATE
32	MODIFIED_BY	NULL	VARCHAR2 (30)
33	MODIFIED_DATE	NULL	DATE

Primary Key

Name	Column
VES_PK	HID
	CREATED_DATE

Table Name : VESSELS Alias :VES

Display Title : Vessels

Object Type:
Comment :

Foreign Keys

VES_POR_FK

POR_ID references PORTS.ID
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----POR_FK_I	----	------	N---------

Table Name : VESSEL_OWNERSHIPS Alias :VO

Display Title : Vessel Ownerships

Object Type:
Comment :

Description : The ownership for a vessel. This ownership could be held in any percentage amount by any number of participants.

Notes : This entity will contain the data related to the ownership of the vessel. The primary key for this record will by the primary keys from the Vessel and Participant entities.

User/Help Text :The ownership for a vessel. This ownership could be held in any percentage amount by any number of participants.

Volumes

Start Rows : End Rows :
Storage

Index-organized ? No

Column Summary

Col.Seq.	Column	Nulls ?	Type
1	PERCENTAGE	NOT NULL	NUMBER (5, 2)
2	PAR_CREATED_DATE	NOT NULL	DATE
3	PAR_SSN_EIN	NOT NULL	NUMBER (11)
4	VES_CREATED_DATE	NOT NULL	DATE
5	VES_HID	NOT NULL	VARCHAR2 (12)

Primary Key

Name	Column
VO_PK	VES_HID
	VES_CREATED_DATE
	PAR_SSN_EIN
	PAR_CREATED_DATE

Table Name : VESSEL_OWNERSHIPS Alias :VO

Display Title : Vessel Ownerships

Object Type:
Comment :

Foreign Keys

VO_PAR_FK

PAR_SSN_EIN references PARTICIPANTS.SSN_EIN
PAR_CREATED_DATE references PARTICIPANTS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

VO_VES_FK

VES_HID references VESSELS.HID
VES_CREATED_DATE references VESSELS.CREATED_DATE
Transferable ? Yes Update Rule : Restricted

Mandatory ? Yes Delete Rule : Restricted

Index Summary

Name	Seq.	Column	Index Type
----AR_FK_I	----	------N_EIN	N---------
VO_PAR_FK_I	2	PAR_CREATED_DATE	NOT UNIQUE
VO_VES_FK_I	1	VES_HID	NOT UNIQUE
VO_VES_FK_I	2	VES_CREATED_DATE	NOT UNIQUE

Designer/200

TABLE DEFINITIONS
End of Report

APPENDIX E: TRANSACTION MODULE SPECIFICATION

General Standards

This will set forth the overall standards not specifically stated in the following specifications.

- All transactions will be created using the ASCII standard character set.
- All transactions will contain a primary key.
- Unless otherwise specified the primary key will be made up of two values. The first value will be the transaction timestamp and the second value will be the Vessel_Id.
- The vessel ID will be either the Coast Guard Number or the State Certificate-of-Number.
- All ID fields will be 10 digit numeric with leading zeros removed.
- For transactions with multiple records, each record will terminate with a Carriage Return and Line Feed (CR/LF).
- All transactions will terminate with a CR/LF followed by a {.
- All money fields will be right justified, no fill, zero padding left of decimal with no numeric punctuation.
- All numeric fields will have leading zeros removed and contain no numeric punctuation.
- All dates fields will be 2 digit date, 2 digit month, 4 digit year (DDMMYYYY).
- Time will be recorded using military formatting (e.g. 24-Hour clock). Hours, minutes, and seconds will be zero filled if less than 10.
- All date time fields will be 2 digit date, 2 digit month, 4 digit year, 2 digit hour and 2 digit minutes (DDMMYYYYHHMM) unless otherwise indicated in field definitions.
- All time fields will be 2 digit hours and 2 digit minutes (HHMM) unless otherwise indicated in field definitions.
- All date and date time fields will be transmitted and stored in Greenwich Mean Time (GMT).
- All reports that display a date will convert GMT data to local date time data using the timestamp offset field in the configuration table.
- A pipe '|' will delimit all fields.
- Encryption will be handled as follows:
  - Transactions will be MIME encapsulations of EDI objects (X12 standard).
  - Sent via SMTP.
  - Secured using Public Key Infrastructure (PKI).
- No confirmation of Receipt Response transactions will be send back by the onboard application. The onboard application will evaluate the response and request retransmission of information if necessary.
- All onboard application transactions will mark records that have been successfully transmitted. This will help reduce the amount of data being transmitted.
- The operator creating the transaction will be contained in the authorization certificate.
- Optional Data will be displayed using the following shading.

- To minimize transmission costs all success or failure responses will be a 2 digit number corresponding to a code table common to both applications.
- A transaction with multiple repeating data records will have the repeating records grouped together. This transaction will have two required format record listings. The first listing is the

header. It will contain a record count variable. This variable will contain the number of repeated records. This will be used to verify that the entire transaction was successfully received.

- If optional data not available terminate record with CR/LF followed by a {versus repeated |.

Table E-1. Ship Request Transaction.

Transaction Name: Ship Request Transaction
Transaction ID: 1
Transaction Usage:
When: Initialization phase for shipboard database.
How: Initialize or update shipboard database with specific data related to the vessel.
Who: Skipper or authorized crewmember

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Byte Count		34		

Associated Tables:
Transactions, Vessels
Validation/Authorization:
Request user ID. Central Database will validate the user ID is authorized to access requested vessel information.
Computation:
For this transaction the Vessel ID will be filled with the requested Vessel ID on this transaction.
Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-2. Trip Request Transaction

Transaction Name: Trip Request Transaction
Transaction ID: 2
Transaction Usage:

When: Initialization phase for shipboard application.

How: Update the shipboard database with the data from the last 60 days of logbook entries or that amount as indicated in the configuration table.

Who: Skipper or authorized crewmember.

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Response_Date	Date	14		DDMMYYYYHHMMSS
Byte Count		49		

Associated Tables:

Transactions, Trips

Validation/Authorization:

Request user ID. Central Database will validate that the user is authorized to access requested trip information.

Computation:

The transaction date will be used as the beginning date in the selection of the record retention period days. The onboard application will locate the most recent trip in its datastore. The date from that trip will be included in the response date field in the transaction and will be used by the central database to locate only those trips not currently in the onboard application datastore.

Assumption

If more that one trip was begun in one day returned trip information might be duplicated. The onboard application will need to filter this information out based on trip ID.

Activity Handling

On Success

If authorized the data request will be processed by the central database.

On Failure

If authorization returns invalid send invalid authorization response.

Table E-3. Crew Request Transaction.

Transaction Name: Crew Request Transaction
Transaction ID: 3
Transaction Usage:
When: Initialization phase for shipboard database.
How: Initialize or update shipboard database with crewmember information. Information can be retrieved either by name, by prior crews for a specific vessel, or prior crews with a specific skipper.
Who: Skipper or authorized crewmember

Note: This transaction is optional.
Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Ssn_Ein	Number	11		
Last_Name	Char	20		
First_Name	Char	15		
Middle_Initial	Char	1		
Byte Count		85		

Associated Tables:
Transactions, Participants
Validation/Authorization:
Request user ID. Central Database will validate that the operator is authorized to access the requested participant information.
Computation:
Using either the SSN/EIN or the Last Name, First Name, Middle Initial combination request specific crewmember.
Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-4. Limit Request Transaction.

Transaction Name: Limit Request Transaction
Transaction ID: 4
Transaction Usage:
When: Initialization phase for shipboard database.
How: Initialize or update the shipboard database with remaining fishable pounds available on permits and quota share.
Who: Skipper or authorized crewmember.

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Permit Number	Number	10		
Pl_Type	Char	20		
Quota Share Number	Number	10		
Qs_Type	Char	1		
Byte Count		79		

Associated Tables:
Transactions, Permit Licenses, Quota Shares
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to access requested limit information.
Computation:

Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-5. New Trip Request Transaction.

Transaction Name: New Trip Request Transaction
Transaction ID: 5
Transaction Usage:
When: Initialization phase for shipboard database.
How: Initialize the shipboard database with a new Trip record. Also initialize or update the shipboard database with new or changed Master Data records from the central database.
Who: Skipper or authorized crewmember.

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Select_Date	Date	8		DDMMYYYY
Byte Count		43		

Associated Tables:
Transactions, Trips, Synchronize
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to access requested management area information.
Computation:
Select the synchronization date in the onboard database from the Synchronize table. If there is no synchronization date then use '01011999'. Insert the date into the select date field in the Transactions table. Send this information to the central database and request a new trip record.
Activity Handling
Note: The user will have to remain connected throughout this transaction and wait for its response.
On Success
If authorized the data request will be processed by the central database. After successful synchronization update the sync_date with the current system date.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-6. Trip Crew Transaction.

Transaction Name: Trip Crew Transaction
Transaction ID: 6
Transaction Usage:
When: At the end of a trip this transaction will be used to update information related to the crew.
How: Update the participant information relating to this trip.
Who: Skipper or authorized crewmember.

Note: This is a grouped transaction. The record count variable indicated the number of repeated records in the second record layout. The final record will terminate with a CR/LF followed by a {.

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		

Field	Datatype	Length	Precision	Format
Ssn_Ein	Number	11		
Last_Name	Char	20		
First_Name	Char	15		
Middle_Initial	Char	1		
Street_Address_1	Char	30		
City	Char	25		
State_Province	Char	2		
Zip_Postal_Code	Char	13		
Primary_Phone	Char	12		
Corporate_Name	Char	40		
Street_Address_2	Char	30		
Country	Char	10		
Secondary_Phone	Char	12		
Fax_Number	Char	12		
Email_Addrress	Char	40		
Authorization	Char	1		

Byte Count 328

Note: The shaded items above are optional data.

Associated Tables:

Transactions, Participants, Participant Roles

Validation/Authorization:

Request user ID. Central Database will validate that the user is authorized to update requested information.

Computation:

Select all non-transmitted crew information that must be updated (i.e. Skipper) and send it, the rest of the crew is optional. The participants and participant role records are grouped together. For each participant there may be more that one role record. Each role record will terminate with a CR/LF.

Table E-6. Continued.

Activity Handling

On Success

If authorized the data request will be processed by the central database.

On Failure

If authorization returns invalid send invalid authorization response.

Table E-7. Consumable Transaction.

Transaction Name: Consumable Transaction
Transaction ID: 7
Transaction Usage:
When: Any time during a trip.
How: Update of the central database based on changes in the shipboard database related to the consumables used during a trip.
Who: Skipper or authorized crewmember

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		

Field	Datatype	Length	Precision	Format
Ct_Type	Char	12		
Id	Number	10		
Description	Char	30		
Cost	Number	7		
Quantity	Number	4		
Quantity_Um	Char	2		

Byte Count 109

Associated Tables:

Transactions, Consumable Types, Consumable Items

Validation/Authorization:

Request user ID. Central Database will validate that the user is authorized to update requested information.

Computation:

Select all non-transmitted Consumable information and send it. Consumable types and items are associated together. Each new consumable record will terminate with a CR/LF.

Activity Handling

On Success

If authorized the data request will be processed by the central database.

On Failure

If authorization returns invalid send invalid authorization response.

Table E-8. Trip Close Transaction.

Transaction Name: Trip Close Transaction
Transaction ID: 8
Transaction Usage:
When: At the completion of a fishing trip.
How: Update the trip information with the final information related to the trip.
Who: Skipper or authorized crewmember.

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		
Trip_Number	Number	10		
Departure_Port	Char	25		
Departure_Timestamp	Date	12		DDMMYYYYHHMM
Landing_Port	Char	25		
Landing_Timestamp	Date	12		DDMMYYYYHHMM
Wages	Number	9	2	

Field	Datatype	Length	Precision	Format
Note_Type	Char	1		
Note_ID	Char	14		
Note_Line_Number	Number	2		
Note_Data	Char	50		

Byte Count 208

Note: The item Note_ID is the record id in the table defined by Note_Type that the note will be written to.

Associated Tables:

Transaction, Trips, Vessels, Fishing Activities, Catches

Validation/Authorization:

Request user ID. Central Database will validate that the user is authorized to update requested information.

Computation:

Before executing this transaction the onboard application will check to see that all trip related data has been transmitted. If non-transmitted data exists the onboard application will prompt the user indicating that all trip related data has not been transmitted. The application will display the types of data that need to be transmitted and request that the user transmit this data. The application will not allow this transaction to proceed until all trip related data has been transmitted.

The transaction will select the data for the trip that is being completed. It will select all 'note' related data from the associated trip related records. It will specify the type of note (i.e. trip, fishing activity, etc), the record ID associated with the note (if necessary) and the note data, which will be split into 50 character blocks. Each note record will terminate with a CR/LF. Once all the data is selected it will send the transaction to the central database.

Table E-8. Continued.

Activity Handling

On Success

If authorized the data request will be processed by the central database.

On Failure

If authorization returns invalid send invalid authorization response.

Table E-9. Fishing Activity Location Transaction.

Transaction Name: Fishing Activity Location Transaction
Transaction ID: 9
Transaction Usage:
When: Used when updating central Database with the fishing activity location information.
How: Update the central database with GPS data related to the fishing trip track.
Who: Skipper or authorized crewmember

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		

Field	Datatype	Length	Precision	Format
Timestamp	Date	14		DDMMYYYYHHMMSS
Latitude	Number	8	5	
Longitude	Number	9	5	
Event_Id	Number	10		

Byte Count 83 ***Note: each additional Fishing Activity Location record will add 46 bytes to the transaction length.***

Associated Tables:
Transactions, Fishing Activity Location

Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.

Computation:
Select all non-transmitted Fishing Activity Location information and send it. All selected Fishing Activity Location records will be separated by a CR/LF.

Activity Handling

On Success
If authorized the data request will be processed by the central database. After the data has been move into the appropriate tables this process will call the appropriate transaction to spatially enable the fishing activity record related to this data.

On Failure
If authorization returns invalid send invalid authorization response.

Table E-10. Fish Act Transaction.

Transaction Name: Fish Act Transaction
Transaction ID: 10
Transaction Usage:
When: Anytime during a fishing trip.
How: Create or update fishing activities in the central database
Who: Skipper or authorized crewmember

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		
Activity_Start	Date	14		DDMMYYYYHHMMSS
Activity_End	Date	14		DDMMYYYYHHMMSS
Target_Strategy	Char	4		
Onboard_Process_Time	Char	5		HHMM
Speed	Number	3		
Course	Char	8		
Fuel_Consumption	Number	5		99999
Cautions	Char	15		
Weather	Char	10		
Wind_Speed	Number	3		
Wind_Speed_UM	Char	2		
Wind_Direction	Char	3		
Wave_Height	Number	2		
Wave_Height_UM	Char	3		
Depth_Range_Bottom	Number	4		
Temperature	Number	3		
Temperature_UM	Char	1		
Byte Count		154		

Associated Tables:

Transactions, Fishing Activities

Validation/Authorization:

Request user ID. Central Database will validate that the user is authorized to update requested information.

Computation:

There could be several fishing activities transmitted at one time so each new fishing activity will terminated with a CR/LF.

Activity Handling

On Success

If authorized the data request will be processed by the central database.

On Failure

If authorization returns invalid send invalid authorization response.

Table E-11. Catch Transaction.

Transaction Name: Catch Transaction
Transaction ID: 11
Transaction Usage:
When: Anytime after the catch has been hauled in.
How: Create or update central database with information related to a catch during a fishing trip.
Who: Skipper or authorized crewmember

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		

Field	Datatype	Length	Precision	Format
Catch_Number	Number	2		
Market_Category_Caught	Char	6		
Depth	Number	5		
Depth_Um	Char	2		
Est_Retained_Weight	Number	6		
Est_Retained_Weight_Um	Char	1		
Est_Retained_Weight_Type	Char	2		
Est_Discard_Weight	Number	5		
Est_Discard_Weight_Um	Char	1		
Est_Discard_Weight_Type	Char	2		
Discard_Reason	Char	1		
Byte Count		82	***Note: each additional Catch record will add 45 bytes to the transaction length***	

Associated Tables:
Transactions, Catches, Fishing Activities
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.
Computation:
Select all non-transmitted Catch information and send it. Each new catch record will terminate with a CR/LF.
Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-12. Marker Transaction.

Transaction Name: Marker Transaction
Transaction ID: 12
Transaction Usage:
When: Used when updating central Database about fishing marker information.
How: Update the central database with GPS data related to fishing marker locations.
Who: Skipper or authorized crewmember

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		

Field	Datatype	Length	Precision	Format
Timestamp	Date	14		DDMMYYYYHHMMSS
Latitude	Number	8	5	999999
Longitude	Number	9	5	9999999

Byte Count 72 ***Note: each additional Marker Location record will add 35 bytes to the transaction length.***

Associated Tables:
Transactions, Marker Locations

Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.

Computation:
Select all non-transmitted Marker information and send it. All selected marker records will be separated by a CR/LF.

Activity Handling

On Success
If authorized the data request will be processed by the central database. After the data has been move into the appropriate tables this process will call the appropriate transaction to spatially enable the trip record related to this data.

On Failure
If authorization returns invalid send invalid authorization response.

Table E-13. Enviro Sensor Transaction.

Transaction Name: Enviro Sensor Transaction
Transaction ID: 13
Transaction Usage:
When: Any time during the fishing activities or at the end of the trip
How: Create in or update the central database with the data about the sensors.
Who: Skipper or authorized crewmember

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		

Field	Datatype	Length	Precision	Format
Id	Number	10		
Sensor_Type	Char	8		
Sample_Method	Char	1		
Sample_Frequency	Char	4		
Frequency_Units	Char	1		
Timestamp	Date	14		DDMMYYYYHHMMSS
Sensor_Reading	Number	8	4	99999999

Byte Count 91 ***Note: each additional record will add 64 bytes.***

Associated Tables:

Transactions, Environmental Sensor, Sensor Readings

Validation/Authorization:

Request user ID. Central Database will validate that the user is authorized to update requested information.

Computation:

This transaction will prompt for the vessel ID. It will package up the downloaded data from the sensor and create a transaction row for each reading for each type of sensor. Each reading will terminate with a CR/LF and each sensor type will also terminate with a CR/LF.

Activity Handling

On Success

If authorized the data request will be processed by the central database.

On Failure

If authorization returns invalid send invalid authorization response.

Table E-14. Gear Values Transaction.

Transaction Name: Gear Values Transaction
Transaction ID: 14
Transaction Usage:
When: Anytime that the characteristic values are changed.
How: Update the central database with the new values for the selected characteristics.
Who: Skipper or authorized crewmember

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		

Field	Datatype	Length	Precision	Format
Id	Number	10		
Value	Char	20		
Value_Units	Char	5		

Byte Count 76 ***Note: each additional value record will add 39 bytes***

Associated Tables:
Transactions, Gear Value
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.
Computation:
Select data related to the gear values used during fishing activities. Terminate each gear value record with a CR/LF.
Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-15. Biological Transaction.

Transaction Name: Biological Transaction
Transaction ID: 15
Transaction Usage:
When: Transfer on-board observer data to the central database, Transfer shore side observer data to the central database.
How: Update the central database with data related to biological samples.
Who: On-board Observers, Port Biologists

Note: This transaction is optional.

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		

Field	Datatype	Length	Precision	Format
Id	Number	10		
Sample_Timestamp	Date	12		DDMMYYYYHHMM
Sample_Method	Char	15		
Id	Char	10		
Id	Number	10		
Name	Char	40		
Value	Char	20		
Value_Units	Char	5		
Specimen_Number	Char	10		
Data_Source	Char	1		
Disposition	Char	2		
Sample_Type	Char	1		
Total_Fish	Number	3		
Total_Weight	Number	6		
Total_Weight_Um	Char	1		
Comments	Char	30		
Weight	Number	6		
Weight_Um	Char	1		
Length	Number	4		
Length_Um	Char	1		
Sex	Char	1		
Reproductive_Condition	Char	1		
Otolith_Taken	Char	1		
Age	Number	2		
Age_Method	Char	1		
Age_Structure	Char	1		
Maturity_Stage	Char	1		
Comments	Char	30		
Byte Count		292		***Note: each additional biological record will***

add 271 bytes

Table E-15. Continued.

Associated Tables:

Transactions, Sub Samples, Species Compositions, Specimens, Specimen Characteristics

Validation/Authorization:

Request user ID. Central Database will validate that the user is authorized to update requested information.

Computation:

Select all Sub Samples and related Species Compositions, Specimens and Specimen Characteristics. Each specimen will terminate with a CR/LF. Each new record with terminate with a CR/LF.

Activity Handling

On Success

If authorized the data request will be processed by the central database.

On Failure

If authorization returns invalid send invalid authorization response.

Table E-16. Protected Species Take Transaction.

Transaction Name: Protected Species Take Transaction
Transaction ID: 16
Transaction Usage:
When: Transfer on-board observer or skipper data to the central database.
How: Update the central database with data related to protected species incidental take information.
Who: On-board Observers, Skipper

Note: This transaction is optional.

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		

Field	Datatype	Length	Precision	Format
Timestamp	Date	14		DDMMYYYYHHMMSS
Id	Number	10		
Value	Char	20		
Value_Units	Char	5		
Number	Char	10		
Code	Number	1		
Length	Number	4		
Length_UM	Char	3		
Entanglement_Situtation	Char	2		
Condition	Char	2		
Brought_Onboard	Char	2		
Photos_Taken	Char	1		
Measurement_Taken	Char	1		
Sample_Taken	Char	1		
Captain_Notified	Char	1		
Captain_Participate	Char	1		
Number_of_Birds	Number	2		
Byte Count		137		***Note: each additional protected species take record will add 99 bytes***

Associated Tables:
Transactions, Protected Species Incidental Takes, Protected Species Values, Tags
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.
Computation:
Select all Protected Species Incidental Takes and related Protected Species Values and Tags. Each Protected Species Incidental Take will terminate with a CR/LF. Each new record

with terminate with a CR/LF.
Table E-16. Continued.

Activity Handling

On Success

If authorized the data request will be processed by the central database.

On Failure

If authorization returns invalid send invalid authorization response.

Table E-17. Protected Species Sighting Transaction.

Transaction Name: Protected Species Sighting Transaction
Transaction ID: 17
Transaction Usage:
When: Transfer on-board observer or skipper data to the central database.
How: Update the central database with data related to protected species sighting information.
Who: On-board Observers, Skipper

Note: This transaction is optional.

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		

Field	Datatype	Length	Precision	Format
Timestamp	Date	14		DDMMYYYYHHMMSS
Latitude	Number	8	5	
Longitude	Number	9	5	
Event_Type	Char	2		
Position	Char	2		
Weather	Char	10		
Wave_Height	Number	2		
Wave_Height_UM	Char	3		
Number_of_Animals	Number	3		
Sighting_Code	Char	2		
Animal_Condition	Char	2		
Animal_Behavior	Char	2		

Byte Count 111 ***Note: each additional biological record will add 73 bytes***

Associated Tables:
Transactions, Protected Species Sightings
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.
Computation:
Select all Protected Species Sightings. Each Protected Species Sighting will terminate with a CR/LF.
Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-18. Gear Alias Transaction.

Transaction Name: Gear Alias Transaction
Transaction ID: 18
Transaction Usage:
When: Anytime during a trip when an alias is changed.
How: Update the central database with data related to gear alias information.
Who: Skipper or authorized crewmember

Note: This transaction is optional.

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		

Field	Datatype	Length	Precision	Format
Id	Number	10		
Name	Char	40		

Byte Count 92 ***Note: each additional biological record will add 54 bytes***

Associated Tables:
Transactions, Gear Alias
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.
Computation:
Select all Gear Aliases that have changed. Each Gear Alias will terminate with a CR/LF.
Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-19. E-mail Transaction

Note: This transaction will not be implemented in the prototype. This transaction might be implemented in the future.

Transaction Name: E-mail Transaction
Transaction ID: 19
Transaction Usage:
When: Used when sending or receiving e-mail.
How: Send transaction to central database connection for transmission to address or receive transaction from central database.
Who: Skipper or Crew Member

Note: This transaction is optional.
Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Sender	Char	30		
Address	Char	40		
Subject	Char	40		
Priority	Char	10		

Field	Datatype	Length	Precision	Format
Line_Number	Number	2		
Message_Line	Char	80		

Byte Count 243 ***Note: each additional message line will add 86 bytes***

Associated Tables:
Transactions
Validation/Authorization:

Computation:
The message will be parsed into 80 character lines repeating until the entire message has been transmitted.
Activity Handling
On Success

On Failure

Table E-20. Ship Response Transaction.

Transaction Name: Ship Response Transaction
Transaction ID: 20
Transaction Usage:
When: Respond to shipboard application/database after selection request has been processed.
How: Send a response to shipboard application to include data elements below and verify synchronization request.
Who: System/Central database.

Note: This transaction is optional.
Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS
Hid	Char	12		
Name	Char	40		
Ves_Type	Char	20		
Coast_Guard_Number	Number	10		
Vhf_Call_Sign	Char	8		
Class	Char	1		
State_Vessel_Number	Number	10		
Reg_State	Char	2		
State_Dmv_Id	Number	10		
Out_Of_State_Number	Number	10		
Hull_Type	Char	30		
Manufacturer	Char	40		
Year_Built	Date	10		DDMMYYYY
Registered_Length	Number	4		
Registered_Length_Um	Char	3		
Ovreall_Length	Number	4		
Ovreall_Length_Um	Char	3		
Width	Number	3	0	
Net_Tonnage	Number	4		
Net_Tonnage_Um	Char	1		
Gross_Tonnage	Number	4		
Gross_Tonnage_Um	Char	1		
Vessel_Cell_Phone	Char	12		
Hold_Capacity	Number	4	0	
Fuel_Capacity	Number	5	0	
Fuel_Type	Char	8		
Gear_Endorsements	Char	40		
Area_Endorsements	Char	40		
Byte Count		419		

Associated Tables:
Transactions, Vessels
Validation/Authorization:
Table E-20. Continued.

Computation:

Select vessel based on data sent.

Activity Handling

On Success

If vessel found then send vessel record back.

On Failure

Send ‘invalid selection’.

Table E-21. Trip Response Transaction.

Transaction Name: Trip Response Transaction
Transaction ID: 21
Transaction Usage:
When: Respond to shipboard application/database after request has been processed to get historical data.
How: Send an update to shipboard application to include data elements below.
Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS

Note: The response variable above will contain a numeric value corresponding to a specific response. The onboard application will evaluate this number for success or failure. The response date variable above will contain the date timestamp from the original request transaction.

Field	Datatype	Length	Precision	Format
Trip_Number	Number	10		
Fish_Ticket	Number	9		
Landed_Date	Date	12		DDMMYYYYHHMM
Location_Caught	Char	6		
Line_Number	Number	2		
Weight_Landed	Number	6		
Weight_Um	Char	1		
Activity_Start	Date	12		DDMMYYYYHHMM
Target_Strategy	Char	20		
Catch_Number	Number	2		
Market_Category_Caught	Char	4		
Depth	Number	5		
Depth_Um	Char	5		
Est_Retained_Weight	Number	6		
Est_Retained_Weight_Um	Char	1		
Est_Retained_Weight_Type	Char	2		
Departure_Port	Char	25		
Departure_Timestamp	Date	12		DDMMYYYYHHMM
Landing_Port	Char	25		
Landing_Timestamp	Date	12		DDMMYYYYHHMM
Wages	Number	9	2	
Notes	Char	250		
Review_Flag	Char	1		
Deductions	Number	9	2	
Condition	Number	5		
Unit_Price	Number	6	2	
Weigh_Back	Number	6	0	
Take_Home	Number	3		
Activity_End	Date	12		DDMMYYYYHHMM

Table E-21.

Continued.

Onboard_Process_Time	Time	5		HHMM
Speed	Number	3		
Course	Char	8		
Fuel_Consumption	Number	5	0	
Cautions	Char	15		
Weather	Char	10		
Wind_Speed	Number	3		
Wind_Speed_UM	Char	2		
Wind_Direction	Char	3		
Wave_Height	Number	2		
Wave_Height_UM	Char	3		
Depth_Range_Bottom	Number	4		
Temperature	Number	3		
Temperature_UM	Char	1		
Note	Char	250		
Est_Discard_Weight	Number	5		
Est_Discard_Weight_Um	Char	1		
Est_Discard_Weight_Type	Char	2		
Discard_Reason	Char	40		
Catch_Notes	Char	250		
Byte Count		1199	***Note: each additional biological record will add 1144 bytes***	

Associated Tables:

Transactions, Trips, Landings, Landing Details, Fishing Activities, Catches

Validation/Authorization:

Based on the transaction date and the response date select the available trips. If the response date is null return the list 60 days of trip information otherwise return the trip information between the two dates.

Computation:

Each new trip record will terminate with a CR/LF.

Activity Handling

On Success

Send requested trip information.

On Failure

Send ‘No Data’.

Table E-22. Crew Response Transaction.

Transaction Name: Crew Response Transaction
Transaction ID: 22
Transaction Usage:

When: Respond to shipboard application/database after selection request has been processed for the requested historical data.

How: Send a response to shipboard application to include data elements below and verify synchronization request.

Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS
Ssn_Ein	Number	11		
Last_Name	Char	20		
First_Name	Char	15		
Middle_Initial	Char	1		
Street_Address_1	Char	30		
City	Char	25		
State_Province	Char	2		
Zip_Postal_Code	Char	13		
Primary_Phone	Char	12		
Corporate_Name	Char	40		
Street_Address_2	Char	30		
Country	Char	10		
Secondary_Phone	Char	12		
Fax_Number	Char	12		
Email_Addrress	Char	40		
Byte Count		340		

Associated Tables:

Transactions, Participants

Validation/Authorization:

Computation:

Select Participant based on data sent.

Activity Handling

On Success

Send participant record back.

On Failure

Send ‘Invalid Selection’ error.

Table E-23. Limit Response Transaction.

Transaction Name: Limit Response Transaction
Transaction ID: 23
Transaction Usage:

When: Respond to shipboard application/database after selection request has been processed for the requested historical data.

How: Send a response to shipboard application to include data elements below and verify synchronization request.

Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS
Permit_Amount	Number	10		
Weight_Remaining	Number	10		
Weight_UM	Char	1		
Byte Count		76		

Associated Tables:

Transactions, Permit Licenses, Species Groups, Quota Shares, Limits, Management Area, Landings, Landing Details, Trips, Configuration, Quota Share Trips

Validation/Authorization:

Computation:

Use the request date to determine the permit period amount. Use the Permit License Id to calculate the remaining amount of fish that can be landed during this period (i.e. permit period amount – landed amount during the period). Store this amount in transaction update amount. Use the Quota Share Id to calculate the remaining amount of fish that can be landed (i.e. (quota share amount * seasonal multiplier)- landed amount). Store this amount in the quota share trips table.

Activity Handling

On Success

Send the quota share trips information and the configurations permit amount.

On Failure

Send appropriate error message.

Table E-24. New Trip Response Transaction.

Transaction Name: New Trip Response Transaction
Transaction ID: 24
Transaction Usage:
When: Respond to shipboard application/database after selection request has been processed.
How: Send a response to shipboard application to include the new trip number. If update verified then start synchronization.
Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	5		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS
Trip Number	Number	10		
Byte Count		69		

Associated Tables:
Transactions, Management Areas
Validation/Authorization:

Computation:
Create new trip record. Insert trip number in transaction. Select all base table (Management Areas, Management Area Boundaries, Common Names, Genus Species, Limits, Species Groups, Roles, Ports, Gear Categories, Gear Characteristics) records with a modified date > the transaction select date else select all base table records with a modified date. Count the number of records selected and insert that number into Record_Count in the transaction. Send the transaction back to the vessel. Prompt the user regarding synchronizing or not.
If response = 'Y' then
process the updates for the selected base table records using the following transactions:
Mgt Area Sync Response Transaction (25)
Category Sync Response Transaction (26)
Species Sync Response Transaction (27)
Protected Species Char Sync Response Transaction (28)
Role Sync Response Transaction (29)
Port Sync Response Transaction (30)
Gear Cat Sync Response Transaction (31)
otherwise abort the update.
Activity Handling
On Success
Send 'processing completed'.
On Failure
Send 'processing failed'.

Table E-25. Mgt Area Sync Response Transaction.

Transaction Name: Mgt Area Sync Response Transaction
Transaction ID: 25
Transaction Usage:
When: Respond to shipboard application/database after selection request has been processed.
How: Send a response to shipboard application to include data elements below.
Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS

Field	Datatype	Length	Precision	Format
Id	Number	10		
Name	Char	40		
Id	Number	10		
Mab_Type	Char	12		
Object	Char	100		
Name	Char	40		
Amount	Number	3		
Unit	Char	2		
Polygon_Id	Number	10		
Corner_Id	Number	10		
Latitude	Number	8	5	
Longitude	Number	9	5	

Byte Count 322 ***Note: each additional biological record will add 267 bytes***

Associated Tables:
Transactions, Management Areas, Management Area Boundaries

Validation/Authorization:
The data returned would be only those records that relate to the permits held by the captain and or the vessel.

Computation:
Each management area will terminate with a CR/LF.

Activity Handling

On Success
Send ‘Management Area synchronization completed’.

On Failure
Send ‘Management Area synchronization failed’. Restore management area table back to original status.

Table E-26. Category Sync Response Transaction.

Transaction Name: Category Sync Response Transaction
Transaction ID: 26
Transaction Usage:

When: Respond to shipboard application/database after selection request has been processed.

How: Send a response to shipboard application to include data elements below and verify synchronization request.

Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS

Field	Datatype	Length	Precision	Format
Code	Char	4		
Create_Date	Date	14		DDMMYYYYHHMMSS
Ctg_Type	Char	10		
Name	Char	40		
State	Char	2		
Gear	Char	15		
Location	Char	15		
Start_Date	Date	8		DDMMYYYY
End_Date	Date	8		DDMMYYYY
Protected	Char	1		

Byte Count 184 ***Note: each additional biological record will add 129 bytes***

Associated Tables:

Transactions, Category

Validation/Authorization:

The data returned would be only those records that relate to the permits held by the captain and or the vessel.

Computation:

Each species group will terminate with a CR/LF.

Activity Handling

On Success

Send ‘Species Group synchronization completed’.

On Failure

Send ‘Species Group synchronization failed’. Restore species group table back to original status.

Table E-27. Species Sync Response Transaction.

Transaction Name: Species Sync Response Transaction
Transaction ID: 27
Transaction Usage:

When: Respond to shipboard application/database after selection request has been processed.

How: Send a response to shipboard application to include data elements below and verify synchronization request.

Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS

Field	Datatype	Length	Precision	Format
Scientific_Name	Char	40		
Common_Name	Char	40		
Avg_Proportion	Number	5		

Byte Count 145 ***Note: each additional biological record will add 89 bytes***

Associated Tables:

Transactions, Species

Validation/Authorization:

The data returned would be only those records that relate to the permits held by the captain and or the vessel.

Computation:

Each species will terminate with a CR/LF.

Activity Handling

On Success

Send ‘Species synchronization completed’.

On Failure

Send ‘Species synchronization failed’. Restore species table back to original status.

Table E-28. Protected Species Char Sync Response Transaction

Transaction Name: Protected Species Char Sync Response Transaction
Transaction ID: 28
Transaction Usage:
When: Respond to shipboard application/database after selection request has been processed.
How: Send a response to shipboard application to include data elements below and verify synchronization request.
Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS

Field	Datatype	Length	Precision	Format
Id	Number	10		
Name	Char	40		
High_Value	Char	20		
Low_Value	Char	20		
Default_Value	Char	20		
Required	Char	1		

Byte Count 173 ***Note: each additional biological record will add 118 bytes***

Associated Tables:
Transactions, Protected Species Characteristics

Validation/Authorization:
The data returned will be only those records that relate to the species found in the local area.

Computation:
Each common name will terminate with a CR/LF.

Activity Handling

On Success
Send ‘Common Name synchronization completed’

On Failure
Send ‘Common Name synchronization failed’. Restore common name table back to original status.

Table E-29. Role Sync Response Transaction.

Transaction Name: Role Sync Response Transaction
Transaction ID: 29
Transaction Usage:
When: Respond to shipboard application/database after selection request has been processed.
How: Send a response to shipboard application to include data elements below and verify synchronization request.
Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS

Field	Datatype	Length	Precision	Format
Id	Number	10		
Rol_Type	Char	9		

Byte Count 77 ***Note: each additional biological record will add 22 bytes***

Associated Tables:
Transactions, Roles
Validation/Authorization:

Computation:
Each role will terminate with a CR/LF.
Activity Handling
On Success
Send ‘Roles synchronization completed’.
On Failure
Send ‘Roles synchronization failed’. Restore role table back to original status.

Table E-30. Port Sync Response Transaction.

Transaction Name: Port Sync Response Transaction
Transaction ID: 30
Transaction Usage:
When: Respond to shipboard application/database after selection request has been processed.
How: Send a response to shipboard application to include data elements below and verify synchronization request.
Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS

Field	Datatype	Length	Precision	Format
Id	Number	10		
Code	Char	4		
Name	Char	40		
City	Char	25		
State_Province	Char	2		
Zip_Postal_Code	Char	13		
Country	Char	10		

Byte Count 167 ***Note: each additional biological record will add 112 bytes***

Associated Tables:
Transactions, Ports
Validation/Authorization:

Computation:
Each port will terminate with a CR/LF.
Activity Handling
On Success
Send ‘Ports synchronization completed’.
On Failure
Send ‘Ports synchronization failed’. Restore ports table back to original status.

Table E-31. Gear Cat Sync Response Transaction.

Transaction Name: Gear Cat Sync Response Transaction
Transaction ID: 31
Transaction Usage:
When: Respond to shipboard application/database after selection request has been processed.
How: Send a response to shipboard application to include data elements below and verify synchronization request.
Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS

Field	Datatype	Length	Precision	Format
Gc_Type	Char	15		
Id	Number	10		
Name	Char	30		
High_Value	Char	20		
Low_Value	Char	20		
Default_Value	Char	20		
Required	Char	1		

Byte Count 179 ***Note: each additional biological record will add 124 bytes***

Associated Tables:
Transactions, Gear Categories, Gear Characteristics
Validation/Authorization:

Computation:
Each gear categories will terminate with a CR/LF.
Activity Handling
On Success
Send ‘Gear Categories synchronization completed’.
On Failure
Send ‘Gear Categories synchronization failed’. Restore gear categories table back to original status.

Table E-32. Receipt Response Transaction.

Transaction Name: Receipt Response Transaction
Transaction ID: 32
Transaction Usage:
When: Respond to shipboard application/database once processing of received data is complete or if an error occurs during processing.
How: Send a receipt to shipboard application to include data elements below.
Who: System/Central database

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Response_to_Transaction_Id	Number	3		
Response	Number	2		
Response_Date	Date	14		DDMMYYYYHHMMSS
Byte Count		56		

Note: The Response to Transaction Id above will contain the Transaction Id from the initiating transaction.

Associated Tables:
Transactions

Validation/Authorization:

Computation:

Activity Handling
On Success
Send response ‘1’.
On Failure
Send response ‘2’.

Table E-33. Landing Transaction.

Note: This transaction will not be implemented in the prototype. Its functionality will be implemented at the Web site. This transaction might be implemented in the future.

Transaction Name: Landing Transaction
Transaction ID: 33
Transaction Usage:
When: Used when a fish catch has been landed at a processor.
How: Update or create landing information in the central system.
Who: Authorized individual at a processing plant or similar facility.

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Fish_Ticket	Number	9		
Landed_Date	Date	12		DDMMYYYYHHMM
Location_Caught	Char	6		
Deductions	Number	9	2	
Byte Count		85		

Associated Tables:
Transactions, Landings
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.
Computation:

Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-34. Landing Detail Transaction.

Note: This transaction will not be implemented in the prototype. Its functionality will be implemented at the Web site. This transaction might be implemented in the future.

Transaction Name: Landing Detail Transaction
Transaction ID: 34
Transaction Usage:
When: Used when a fish catch has been landed at a processor.
How: Updates or creates landing detail information in the central system.
Who: Authorized individual at a processing plant or similar facility.

Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Record_Count	Number	3		
Line_Number	Number	2		
Weight_Landed	Number	6		
Weight_Um	Char	1		
Condition	Number	5		
Unit_Price	Number	6	2	
Weigh_Back	Number	6		
Take_Home	Number	3		
Byte Count		74		

Associated Tables:
Transactions, Landing Details
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.
Computation:

Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-35. Ancillary Transaction.

Transaction Name: Ancillary Transaction
Transaction ID: 35
Transaction Usage:
When: Used when ancillary equipment is added or changed on vessel (i.e. Radar, Sonar, Sounder, etc)
How: Update the central database with data related to ancillary equipment changes on the vessel.
Who: Vessel Owner

Note: This transaction is optional.
Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Id	Number	10		
Ae_Type	Char	20		
Make	Char	30		
Model	Char	30		
Byte Count		128		

Associated Tables:
Transactions, Ancillary Equipment
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.
Computation:
Select all non-transmitted ancillary equipment and send.
Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-36. Process Equip Transaction.

Transaction Name: Process Equip Transaction
Transaction ID: 36
Transaction Usage:
When: Used when processing equipment is added or changed on the vessel
How: Update the central database with data related to processing equipment changes on the vessel.
Who: Vessel Owner

Note: This transaction is optional.
Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Id	Number	10		
Pe_Type	Char	20		
Make	Char	30		
Model	Char	30		
Amount	Number	3		
Age	Number	2		
Life_Expectancy	Number	2		
Byte Count		138		

Associated Tables:
Transactions, Processing Equipment
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.
Computation:
Select all non-transmitted Processing Equipment and send.
Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-37. Propulsion Transaction.

Transaction Name: Propulsion Transaction
Transaction ID: 37
Transaction Usage:
When: Used when the propulsion system(s) are added or changed on the vessel.
How: Update the central database with data related to propulsion systems are changes on the vessel.
Who: Vessel Owner

Note: This transaction is optional.
Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Id	Number	10		
Type	Char	1		
Engine_Type	Char	8		
Engine_Make	Char	15		
Engine_Model	Char	15		
Horsepower	Number	8		
Engine_Age	Number	2		
Overhaul_Date	Date	11		DDMMYYYYHHMM
Life_Expectancy	Number	2		
Byte Count		115		

Associated Tables:
Transactions, Propulsion Type
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.
Computation:
Select all non-transmitted Propulsion information and send.
Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.

Table E-38. Structure Mod Transaction.

Transaction Name: Structure Mod Transaction
Transaction ID: 38
Transaction Usage:
When: Used when structural modifications are made to the vessel
How: Update the central database with data related to structural modifications on the vessel.
Who: Vessel Owner

Note: This transaction is optional.
Required Format:

Field	Datatype	Length	Precision	Format
Tran_Timestamp	Date	14		DDMMYYYYHHMMSS
Vessel_Id	Char	12		
Transaction_Id	Number	3		
Id	Number	10		
Modification_Date	Date	12		DDMMYYYYHHMM
Modification_Details	Char	250		
Byte Count		259		

Associated Tables:
Transactions, Structural Modifications
Validation/Authorization:
Request user ID. Central Database will validate that the user is authorized to update requested information.
Computation:
Select all non-transmitted Structure Modification information and send.
Activity Handling
On Success
If authorized the data request will be processed by the central database.
On Failure
If authorization returns invalid send invalid authorization response.